


# EXHIBIT 13

## Pregnant Florida mom uses AR-15 to kill home intruder

 [nypost.com/2019/11/04/pregnant-florida-mom-uses-ar-15-to-kill-home-intruder](https://nypost.com/2019/11/04/pregnant-florida-mom-uses-ar-15-to-kill-home-intruder)

Joe Tacopino

November 4, 2019



A pregnant woman is credited with saving the lives of her husband and daughter after she used an AR-15 to fatally gun down a home intruder, a report said.

The hero mom sprung into action when two intruders entered the family's Lithia, Fla. home last week and pistol whipped her husband while violently grabbing their daughter, according to the Hillsborough County Sheriff's Office.

"They came in heavily hooded and masked," the husband, Jeremy King, told Bay News 9.

"As soon as they had got the back door opened, they had a pistol on me and was grabbing my 11-year-old daughter."

The robbers then pistol-whipped King and kicked him while the man's wife, who is eight months pregnant, retreated into the bedroom.

“When he came toward the back door in her line of sight, she clipped him,” King told the outlet. “He made it from my back door to roughly 200 feet out in the front ditch before the AR did its thing.”

Police said in a press conference that they found the man’s dead body lying in the ditch nearby. The second suspect was on the loose.

The homeowner said he took a “severe beating,” but credited his wife for saving him.

“I’ve got a fractured eye socket, a fractured sinus cavity, a concussion, 20 stitches and three staples in my head,” said King.

“Them guys came in with two normal pistols and my AR stopped it. [My wife] evened the playing field and kept them from killing me.”

The sheriff’s office added that the firearm was in the home legally.

# EXHIBIT 14

## Santa Monica Owner Protects His Store With Guns Amid Looting

 [cbsnews.com/losangeles/news/santa-monica-owner-defends-his-store-with-guns-amid-looting](https://www.cbsnews.com/losangeles/news/santa-monica-owner-defends-his-store-with-guns-amid-looting)

**SANTA MONICA (CBSLA)** – As looters were ransacking stores in Santa Monica Sunday during the George Floyd protests, one man took matters into his own hands.



A Santa Monica, Calif., liquor store owner and his friends defend the store with guns during the looting.  
May 31, 2020. (CBSLA)

The owner of Broadway Wine & Spirits, located in the 1000 block of roadway, told CBSLA he and some friends decided to stand in front of his store armed with guns.

He said that as looters neared the store, they instead decided to keep walking once they saw his AR-15 and the other guns.

"It was a good thing I had my customers and friends by my side, because it was pretty scary," Joe told CBSLA.

Joe said he and his friends also helped keep other nearby businesses safe as well.

Santa Monica's Third Street Promenade was hit hard by looting and fires Sunday. A Vons grocery store in the 700 block of Broadway was completely ransacked as well. Santa Monica Mayor Kevin McKeown said nine fires were set. There were no serious injuries to officers or protesters.

Santa Monica will again be under curfew orders Monday beginning at 1 p.m. for its business districts and 4 p.m. citywide.

## **More from CBS News**

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# EXHIBIT 15

## MCSO: 2 of 4 intruders dead, homeowner injured in home invasion

 [ocala.com/story/news/crime/2019/07/11/mcso-2-of-4-intruders-dead-homeowner-injured-in-home-invasion/4715552007](https://ocala.com/story/news/crime/2019/07/11/mcso-2-of-4-intruders-dead-homeowner-injured-in-home-invasion/4715552007)

CRIME

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*Correction: The crimes occurred in the 14900 block of Southeast 32nd Court Road in Summerfield. A previous version of this article indicated the wrong block.*

SUMMERFIELD — Marion County sheriff's officials say a homeowner armed with an AR-15 shot and killed two intruders and was injured himself during a home invasion robbery in Summerfield Wednesday night.

Two other robbery suspects — Robert John Hamilton, 19, of Ocala, and Seth Adam Rodriguez, 22, of Belleview — were detained near the scene, according got the Marion County Sheriff's Office.



Nigel Doyle, 22, of Summerfield, and Keith Jackson Jr., 21, Ocala, were killed. The homeowner, whose name was not released by the Sheriff's Office, was in stable condition at a hospital Thursday morning.

Rodriguez was arrested on charges of murder and home invasion robbery with a firearm. Hamilton faces home invasion robbery with a firearm.

Deputies got the call at 8:21 p.m. and went to the home at 14999 SE 32nd Court Road in response to a report of shots fired..

Sgt. Micah Moore found Doyle with a gunshot wound and a shotgun next to him on the ground. Deputies entered the home and found Jackson dead on the dining room floor. Detectives said he was wearing a "Jason" mask on top of his head, gloves on both hands, jeans and a black shirt.

Near Jackson's head was a semi-automatic pistol, detectives said.

Continuing into the home, deputies found the 61-year-old homeowner in a bedroom.

He had an AR-15 rifle on his legs and was bleeding from a gunshot wound to the stomach, according to sheriff's officials. Doyle and the homeowner were transported to Ocala Regional Medical Center, where Doyle died.

Deputies continued to search the area.

Deputy Austin Coon and K-9 Deputy Alberto Gago, with his dog Nitro, found Rodriguez and Hamilton in the 15000 block of Southeast 36th Avenue, according to arrest reports. Rodriguez was hiding in tall grass on the side of the road.

He was wearing sweat pants and a purple shirt. Hamilton was wearing all black clothing.

Deputies said the men were sweating.

The mobile home where the shooting occurred is on a 20-acre lot with dense woods and a single-lane dirt driveway. The distance from a gate to home is roughly 300 yards.

Deputies found a Volkswagen parked near the south side of the home. The front doors were open.

Deputies recovered a pump-action shotgun on the ground next to the front porch. They reported smelling a strong odor of marijuana at the home.

The homeowner told Detective Travis O'Cull that, about an hour before the shooting, a male who he barely remembers from a past Craigslist transaction, knocked on the front door, according to sheriff's officials.

The homeowner said he did not open the door but saw the male peering through a back sliding glass door. He said he asked the male what he was doing and was told he needed help with his vehicle.

The homeowner said he told the individual he was disabled and couldn't help him. That person then left and homeowner went to sleep.

The homeowner told the detective he was awakened by a loud noise and grabbed his AR-15, which was near his bed. He saw a masked person inside the home, he said, and he and the intruders exchanged gunfire. He said he shot at the man in the mask and at a second person coming toward him.

The homeowner said it was Jackson who shot him.

Detectives Ian Simpson and John Lightle interviewed Rodriguez and Hamilton.

According to arrest reports, Rodriguez said he, Hamilton, Doyle and Jackson were Doyle's home earlier in the day and that Doyle and Jackson planned to rob the Summerfield home for marijuana and guns.

They left Doyle's home in Jackson's car and went to there, the report states. Rodriguez said Hamilton kicked in the front door and Doyle and Jackson rushed inside. Rodriguez said he heard gunshots from the homeowner.

Rodriguez said Doyle had given him a BB gun at the doorway. He said he ran away and got rid of the weapon.

Hamilton told the detectives he got out of the car before the robbery and walked down the street. He denied being at the scene. After the interviews, both men were arrested.

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# EXHIBIT 16

## Gun instructor uses AR-15 to stop attacker in Oswego: 'He was a half a breath away from getting his head blown off '

 [chicagotribune.com/suburbs/aurora-beacon-news/ct-abn-oswego-stabbing-charges-st-0227-20180227-story.html](https://chicagotribune.com/suburbs/aurora-beacon-news/ct-abn-oswego-stabbing-charges-st-0227-20180227-story.html)

Hannah Leone



Dave Thomas, 41, a National Rifle Association instructor talks about his decision to use his AR-15 as a scare tactic to stop a stabbing Feb. 27, 2018, in Oswego. The stabbing occurred the day prior. (Chris Sweda / Chicago Tribune)

Dave Thomas was getting ready for work Monday afternoon when he heard women screaming in his apartment building in Oswego.

Thomas, a gun instructor, peeked out the door and saw blood in the hallway. He went to his bedroom, where a handgun and an AR-15 assault-style rifle were lying on the bed. He picked up the rifle.

"I teach people how to defend themselves, and it was just a reaction to grab the AR-15," he said.

Police said Thomas confronted a man who was stabbing another man in the apartment complex on the 100 block of Harbor Drive. The man with the knife ran off when Thomas threatened to shoot him.

### TODAY'S TOP VIDEOS

"He was a half a breath away from getting his head blown off and he knew that," Thomas, 41, said. "That's why he put the knife down."

Kendall County sheriff's deputies arrived about 5 p.m. and arrested two people, the man suspected of stabbing his neighbor and a woman with him. The neighbor was treated and released from Rush Copley Medical Center in Aurora, according to the sheriff's office.

Jacob Currey, 22, who lives in the building, was charged with aggravated battery and mob action. The same charges were filed against Alyssa Wright, 19, of Naperville. Both had a bond hearing scheduled for Wednesday.

A 27-year-old woman who lives in the building said she had ordered pizza and went outside to meet the delivery driver when Currey started to fight with her. That escalated into him stabbing her husband inside the building. The knife also nicked her leg, she said.

The woman said she is nine months pregnant and was already on bed rest. "He told me he was gonna kill my baby — while his hand was covered in my husband's blood," she said.

A sheriff's spokesman, Detective Bryan Harl, credited Thomas with preventing the situation from getting worse, and said the investigation showed he'd done nothing criminal. "He did in the moment what he thought was going to de-escalate this situation and stop any further violence or loss of life and for that he is to be praised," Harl said.

Thomas has a valid firearm owner's identification card and a concealed carry permit, the sheriff's office said. Thomas said he used to train with police. His current job includes teaching concealed carry classes, and he also works private security. He has lived in Oswego since 2004.

Thomas believes if he'd grabbed the smaller gun, the threat would have been less effective and he would have ended up shooting the man.



"I think this is a perfect example of why... every single law-abiding citizen should have an AR-15," Thomas said, adding that they should have proper training.

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Feb 27, 2018 at 8:32 pm

[Forbes: The Latest Billionaire Rankings and Net WorthsForbes |](#)

- -   
Ginnie Newhart, wife of comedy legend Bob Newhart, diesGinnie Newhart, who was married to comedy legend Bob Newhart for six decades and inspired the classic ending of his “Newhart” series, has died. She was 82.Chicago Tribune
  -   
Letters: Editorials and letters offer unrelenting criticism of Mayor Brandon JohnsonIf we’re going to criticize Mayor Brandon Johnson, let’s do it for legitimate reasons.Chicago Tribune
- Forbes Billionaires List: Who made the cut?Forbes |
- - New Permanent Teeth In 24 HrsNuvia Dental Implant Center|
  - Football Lives at Elephant & Castle!Elephant & Castle|
- 2018
- > March
- > 1

# EXHIBIT 17

## Homeowner's son shoots, kills three would-be burglars

 [foxnews.com/us/homeowners-son-shoots-kills-three-would-be-burglars](https://www.foxnews.com/us/homeowners-son-shoots-kills-three-would-be-burglars)

Fox News



Sheriff's deputies gather outside a home in Broken Arrow, Okla., where three intruders were shot and killed Monday, March 27, 2017. (KOKI-TV)

Three would-be robbers were shot and killed Monday when an Oklahoma homeowner's son opened fire on them with an AR-15, authorities said.

Wagoner County sheriff's deputies were called to the home in Broken Arrow, southeast of Tulsa at around 12:30 p.m. local time. When they arrived, they found the three dead suspects and two uninjured residents.

Sheriff's spokesman Deputy Nick Mahoney said the suspects entered the home through a glass back door with the intent to burglarize it. It was not immediately clear why they picked that home.

Mahoney said the suspects encountered the homeowner's 19-year-old son, who opened fire after an exchange of words. Two of the suspects died in the home's kitchen while a third was found in the driveway.



It was not immediately clear whether the suspects were armed, but Mahoney said the preliminary investigation indicated the shootings were in self-defense. The homeowner's son volunteered to give a statement at the sheriff's office.

This is very, very unusual for us [in Wagoner County]," Mahoney told the Tulsa World. "It's not something we're used to."

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Your Money



# EXHIBIT 18

## Fast Reloading of Guns in the 19th Century

 [reason.com/volokh/2023/06/05/fast-reloading-of-guns-in-the-19th-century](https://reason.com/volokh/2023/06/05/fast-reloading-of-guns-in-the-19th-century)



This post describes the speediest means of reloading firearms in the 19th century. The main focus is not the ammunition capacity of any particular type of arm, but rather how quickly various arms could be reloaded after the initial ammunition was spent.

As the post also explains, although the 19th century was, by far, the century of the greatest advances in firearms, many of those advances were not truly new. Rather, the advances were the results of improvements in manufacturing that greatly reduced the price of gun types that previously had been very expensive.

The post covers, in order:

- Spencer lever-action rifles (fast reloads of 7-round tubular magazines);
- Girardoni rifles (20-round tubular speedloaders);
- bolt-action rifles (reloads via detachable box magazines or stripper clips);
- double-barreled shotguns (over 30 shots per minute);

- semiautomatic handguns (detachable box magazines or stripper clips);
- metallic cartridge revolvers (via circular speedloaders);
- cap-and-ball revolvers and pepperboxes (for revolvers, cylinder swaps starting with an 1858 Remington patent);
- finally, and perhaps most surprisingly, the large progress in reloading speed of single-shot muskets and rifles, thanks to the replacement of muzzleloading with breechloading.

### **Spencer lever-action rifles**

The first repeating long guns that became a major commercial success were lever-action rifles. They were introduced in the late 1850s. The first commercially successful lever action was the Henry Rifle of 1860; it held 15 rounds in a tubular magazine under the barrel, plus one round in the firing chamber.

Lever action rifles are fast shooters. Today, the champions of the Single Action Shooting Society can fire 10 shots in 2 seconds. The competition requires use of unimproved replicas of common 19th century arms. Once the user had fired all 16 shots from a Henry—or all 18 shots from its successor, the Winchester Model 1866—reloading would take some time, as the user would have to drop cartridges one at a time into the magazine.

Much faster reloads were possible with the Spencer lever action repeating rifles and carbines), which was also introduced in 1860. During the Civil War, the Spencer Repeating Rifle Company, of Boston, made 144,500 rifles and carbines (short rifles), including 34,000 subcontracted to the Burnside Rifle Company of Providence, R.I. Burnside also made the Burnside Carbine, similar to the Spencer but with different rifling. The company's founder, Ambrose Burnside, was a Union general, strong advocate of using black volunteers in combat, future R.I. Senator and Governor, future first President of the National Rifle Association, and the namesake of "sideburns."

Of the Boston production, 107,372 were sold to the U.S. government, as were 30,052 of the Providence production. The disposition of the rest was presumably private sale, which would almost certainly include some Union soldiers buying arms for themselves. The Spencer was a preferred firearm for cavalrymen. Norm Flayderman, *Flayderman's Guide to Antique American Firearms* 633 (9th ed. 2007).

The Spencer held 7 rounds in a tubular magazine in the buttstock. After firing 7 rounds, the user could pour in 7 fresh rounds using the Blakeslee speedloader, patented in 1864. The Blakeslee cartridge box kit could hold up to 13 tubes, with 7 rounds each.

The principle of the detachable magazine had been put into use long before, albeit not on a scale as large as Spencer's. After the American Revolution, American inventor Joseph Belton moved to England, where starting in 1786 he created 7-shot breechloading repeaters

with detachable metal magazines for the British East India Company. The 1786 gun had 7 separate firing pans, each of which needed to be reprimed after a magazine change.

In America, Belton is most famous for a prior 1777 invention. During the Revolution, in Philadelphia he demonstrated a gun that fired 16 shots at once. The observing committee – which including two American generals and scientist David Rittenhouse–wrote to the Continental Congress urging adoption of the gun. Letter from Joseph Belton to the Continental Congress (July 10, 1777), in 1 Papers of the Continental Congress, Compiled 1774–1789, Petitions Addressed to Congress 139 (1957). The Continental Congress ordered a hundred, but could not come to terms with Belton on the price. J. Cont. Cong., at 324, 361 (May 15, 1777). He insisted on £130 per gun, equivalent to £27,258 today, or \$34,174–too much for a government that already couldn't make ends meet.

Another ancestor of Civil War Spencer was the lever-action Kalthoff repeater of 17th-century Europe. Some of them could fire 30 rounds without reloading. They "spread throughout Europe wherever there were gunsmiths with sufficient skill and knowledge to make them, and patrons wealthy enough to pay the cost. . . . [A]t least nineteen gunsmiths are known to have made such arms in an area stretching from London on the west to Moscow on the east, and from Copenhagen south to Salzburg. There may well have been even more." Harold L. Peterson, *The Treasury of the Gun* 230 (1962).

However, like all repeaters of the time, the Kalthoffs were much more expensive than standard infantry firearms. This is because repeaters, by their nature, have more intricate internal parts than single-shot guns, and the repeater's parts must fit together more precisely than in single-shots. If a Kalthoff part broke, the gun could only be repaired by a specialist gunsmith. The widespread adoption of lever action repeaters was impractical until the American industrial revolution, when, as described in a previous post, federal government industrial policy created a firearms industry that could mass produce high-quality intricate and interchangeable parts.

Although many Union soldiers provided their own firearms, as did Confederates, the majority of Union soldiers used firearms issued by War Department. When the Civil War ended, the U.S. government owned many more firearms than it would need for the soon-to-be much smaller post-war Army. Pursuant to General Order no. 101 (May 30, 1865), Union soldiers were allowed to buy their government-issued firearm for a deduction from their monthly pay. The most expensive was the Spencer, for \$10. Muskets were \$6, and revolvers or non-Spencer carbines \$8. In 1865, the monthly pay for a Union private was \$16. For sergeants it was \$17 to \$21, for lieutenants \$105.50, and more for higher ranks.

## **Bolt-action rifles**

The bolt-action rifle had been invented in 1836. Single-shot bolt-action rifles started becoming widespread in 1866. The magazine-fed bolt-action repeaters became standard infantry arms in the 1880s. Some of them used detachable box magazines, such as the 8-round 1888 British Lee-Metford.

Other models had a fixed (permanently attached) magazine that could quickly be reloaded with stripper clips. The clips held the rounds of ammunition in a straight line at their base, so they could speedily be shoved into an empty fixed magazine.

### **Girardoni rifles**

The Spencers, with their speedloaded tubular magazine, used a system also used by the earlier Girardoni air rifle. Invented for Austrian army snipers in 1779, the Girardoni had a tubular magazines for 21 or 22 rounds, depending on .49 or .46 caliber. Each Girardoni came with four speedloading tubes; once the gun's magazine was empty, pouring in 20 more rounds was simple and fast. Because of the air bladder's finite capacity, a Girardoni could fire about 40 shots before the air bladder needed to be pumped up again. That took 1,500 strokes of the special pump.

Ballistically equal to a powder gun, the Girardoni could take an elk with one shot. The best gun of its time, the Girardoni was used by the Austrian army for decades, but did not become widespread in America. Most importantly, it was quite expensive. Second, after years of rough use, the neck connecting the bladder to pump would weaken, so that air refills became impossible. Like other early firearms, the very expensive Girardoni set a high standard that would eventually become attainable by firearms made for ordinary consumers.

### **Semiautomatic firearms**

These were invented in 1884. The first ones to become major commercial successes were the Mausers C96 pistol starting in 1896, and the Luger in 1899. The former had a fixed magazine fed by stripper clips, the latter a 10-round detachable box magazine.

### **Double-barreled long guns**

The double-barreled gun was invented in 1616. W.W. Greener, *The Gun and Its Development* 102 (9th ed. 1910). By the 1880s, breechloading and metallic cartridges had made the double-barreled shotgun into a fast shooter. With a flip of a switch, the gun could break open: the barrels would tilt down and the two empty cartridges would be ejected. The user could then drop two fresh cartridges into the exposed barrel breeches. The rate of fire was about 26 rounds per minute for aimed shots, and "upwards of thirty" otherwise. Greener at 504.

### **Metallic cartridge revolvers and pepperboxes**

The modern form of the metallic cartridge was invented in 1853, and is used by the vast majority of modern firearms. A metal cylinder holds the bullet, gunpowder, and primer all in a single unit. Its predecessors date back to the reign of King Henry VIII.

The first American revolver to use metallic cartridges was the 7-round breechloading Smith & Wesson New Model 1, introduced in 1857.

In the next section, I will explain how previous models of revolvers—the muzzleloading cap-and-ball type—had to be laboriously reloaded by ramming a bullet from the front of the cylinder to the back. The new Smith & Wesson opened on a hinge, exposing all 7 chambers at the back of the cylinder. When reloading, the user would use an attached rod to push out the now-empty shell of a fired cartridge. Then the user could drop a fresh round into the empty cylinder chamber. For a full reload, the process would be repeated for each chamber. The ammunition for the Model 1 was Smith & Wesson's new .22 rimfire short, which is still in use today.

Pepperboxes are similar to revolvers, but have multiple rotating barrels; they are discussed in more detail in the next section. In 1859, the first pepperbox using metallic cartridges was produced by Sharps. Production would be over 150,000. Lewis Winant, *Pepperbox Firearms* 78, 87 (1952).

Reloading a S&W revolver was faster than reloading a pre-1858 cap-and-ball revolver; cap-and-ball reloading became much quicker starting in 1858, thanks to a Remington patent discussed in the next section.

In the 1860s and 1870s, metallic cartridge firearms displaced firearms using older types of ammunition. As the process continued, reloading of revolvers with metallic cartridges sped up.

The S&W New Model 1 broke open from the bottom, via a hinge on the top. Later, "top break" revolvers put the hinge on the bottom. The user did not have to turn the gun upside-down to reload. Opening a top break revolver automatically ejected all the empty shells from the entire cylinder.

In 1879 the first speedloader for revolvers was patented. It was a circular clip that held six rounds of ammunition in the exact position of a revolver cylinder. While 6 rounds had become the standard capacity for revolvers, some models had more or fewer, so they would need speedloaders made for the revolver's particular capacity and caliber.

With the entire back of the cylinder the exposed, the user places the speedloader over the empty cylinder and then turns a knob on the speedloader to release the cartridges all at once, dropping them into the cylinder. With some practice, the process is quick, albeit not as



fast as swapping detachable box magazines on a semiautomatic firearm. In the days when many or most law enforcement officers carried revolvers—that is, up until about the 1990s—speedloaders were standard on an officer's duty belt.

In 1889 came the swing-out cylinder, which is ubiquitous on modern revolvers. The cylinder is attached to revolver's frame via a hinge called a "crane." Like the top break, the swing-out exposes all cylinder chambers simultaneously. A few years later Smith & Wesson introduced an ejector rod to push out every empty shell from the cylinder all at once. Speedloaders made for a top break revolver can work for a swing-out, and vice versa.

### **Cap and ball revolvers and pepperboxes**

The first repeating firearms to become huge commercial successes in the United States were handguns, starting in the 1830s. Although the Colt revolver was patented in 1836, until the 1850s revolvers were overshadowed by pepperboxes. In a revolver, a cylinder holds several rounds of ammunition, most typically 5 to 7. Before each shot, the cylinder is rotated by mechanical action from the trigger or hammer, and the cylinder aligns the next round in the cylinder's chambers with the barrel. A pepperbox works similarly, except that the pepperbox has a separate barrel for each round of ammunition; the barrels rotate around an axis. (Some earlier models of pepperboxes wrapped the barrels around an axis, but the barrels did not rotate.)

Pepperboxes were less accurate than Colt revolvers, but accurate enough at close range. Many pepperboxes could fire faster than a Colt revolver because they were double-action; that is, they fire as fast as the user can press the trigger. In contrast, the Colt revolvers were single-action; before pressing the trigger, the user had to cock the hammer with his thumb. The first Colt revolvers had five shots, whereas many pepperboxes had six. Perhaps most importantly, the Colt revolver could cost four times as much as a pepperbox. Paul Henry, *Ethan Allen and Allen & Wheelock* 4, 17, 48, 59 (2006) (Allen price of \$8 to \$8.50 to dealers).

The largest-capacity American-made pepperbox appears to be the 10-shot Pecare & Smith, introduced in 1849. Lewis Winant, *Pepperbox Firearms* 58 (Palladium Press 2001) (1952).

The first American pepperbox patent was by Darling in 1836. Winant at 20. The leading American manufacturers were various companies associated with Ethan Allen. Allen was not the same person as the illustrious Vermont patriot of the American Revolution. The 19th-century Allen *is* the person who founded the company that today sells fine furniture. He "was a pioneer in the transition from handmade to machine-made and interchangeable parts." *Id.* at 28.

"The Allens were very popular with the Forty Niners. . . . The pepperbox was the fastest shooting handgun of its day. Many were bought by soldiers and for use by state militia. Some saw service in the Seminole Wars and the War with Mexico, and more than a few were



carried in the Civil War." They were last used in a major engagement by the U.S. Cavalry in an 1857 battle with the Cheyenne. *Id.* at 30.

Like lever actions, neither revolvers nor pepperboxes were truly new. In the 18th century and before, expert gunsmiths made revolvers for wealthy customers, but their main business was single-shot flintlocks. Starting in the 1810s, Eilisha H. Collier of Boston began working on revolving pistols and rifles. He was the first gunsmith "to be known *solely* as a manufacturer of revolvers." John Nigel George, *English Guns and Rifles* 231 (1947). In 1819-20, while working in London, Collier produced 150 revolvers, "a very respectable figure for an expensive hand-made weapon of that type." *Id.* at 236.

In 1715, John Pimm of Boston made a 6-shot flintlock revolver that resembles a modern Smith & Wesson .38 Special. M.L. Brown, *Firearms in Colonial America: The Impact on History and Technology 1497-1792*, at 255-56 (1980). King Henry VIII (reigned 1509-47) owned a four-shot matchlock revolver. Greener at 81-82.

Far more mainstream than King Henry's gun were the magazine-fed Lorenzoni handguns of the 1600s. They used a cylinder that was rotated via a lever into three different positions to load a fresh ball, a fresh gunpowder charge, and fresh priming powder. While the Lorenzoni cylinder did revolve, the cylinder held only one bullet and an appropriate amount of gunpowder at a time. The cylinder was revolved in order to reload a fresh bullet from one internal magazine, and fresh powder from another such magazine.

Pepperboxes also predate 1600. One well-known model was the "Holy Water Sprinkler," consisting of several barrels wrapped around the staff of a mace; some said that Henry VIII carried one. Winant at 7, 11. In the latter 17th century, pepperboxes were made by Jan Flock of Holland, and in the late 18th by Henry Nock of England. *Id.* at 13-14. Once the percussion cap was invented in the early 19th century, an unknown gunsmith in Pennsylvania made a 6-shot pepperbox. *Id.* at 18.

There are two main reasons why pepperboxes and revolvers started to become widely popular in the 1830s rather than the 1540s. The first was a change in firearms ignition.

Previously, firearms had used either flintlock or matchlock ignition. Matchlocks were obsolete in America and England long before 1791. The wheellock, invented by Leonardo da Vinci, was a step on the way to the flintlock. In flintlocks and matchlocks, the firing begins by igniting loose gunpowder in the firing pan. For a flintlock, the ignition is by sparks from a flint striking steel; for a matchlock, by the trigger lowering a slow-burning hemp cord to the firing pan. The firing pan is connected to the main gunpowder charge in the breech (back) of the barrel by a narrow channel that enters the barrel via a small touch hole. In the early 1805, after 12 years of careful work, Scotland's Rev. Alexander Forsyth invented percussion

ignition: the hammer of a firearm would strike a small explosive (the fulminate) and that explosion would ignite the main gunpowder charge in the firearm's barrel. Percussion priming made it possible to have several rounds ready to fire, without the need to refill a priming pan.

A second reason why revolvers and pepperboxes became ordinary consumer items in the 1830s rather than the 1540s was manufacturing cost. Being mechanically more complex than single-shot guns, repeaters could be, and were, produced artisanally from the fifteenth century onward, but required many hours of expert labor. Mass production for a large consumer market became possible as a result of the Madison-Monroe industrial policy, begun in 1815, of federal investment in research and development of machine tools for the mass production of firearms from interchangeable parts.

All the American pepperboxes, as well as the Colt revolvers in their first decades, were cap and ball firearms. That is, they were a type of muzzleloader. To load a round, the user poured gunpowder into a revolver's cylinder chamber (or one of the barrels on a pepperbox) from the front, and then rammed a bullet into place. At the back of the same cylinder chamber (or barrel, for a pepperbox), the user would place a percussion cap on a nipple. Then the process would have to be repeated for the next cylinder chamber (revolver) or barrel (pepperbox). For revolvers, a short ramrod on a pivot was typically attached underneath the barrel. With the cap and ball system, once a handgun was empty, a full reload was far from instantaneous.

That changed in 1858, with the third version of the new Remington "Beals" revolvers. Remington had patented the first and second Beals models in 1856 and 1857. Charles Schiff, *Remington's First Revolvers: The Remington Beals .31 Caliber Revolvers 6-8* (2007) (Patents 15,167 & 17,359). In the 1858 patent, no. 21,478, the barrel was affixed to the revolver frame by a single pin, and the pin was designed to be easy to remove. The user would push out the attachment pin, replace the empty cylinder with a fresh, preloaded cylinder, put the barrel and pin back into place, and be ready to shoot. *Id.* at 48. As Remington advertising explained, "The efficiency of the arm may be greatly increased by the addition of duplicate cylinders, thus affording the advantage of a brace [pair] of Pistols at a trifling additional expense." *Id.* at 106 (reprinting advertisement that ran in the *George W. Hawes' Ohio State Gazetteer and Business Director* in 1859-60).

Another company, U.S. Starr Arms, made revolvers with a similar mechanism, using a screw for attachment, and designed for fast reloads. Colt revolvers had an attachment pin, but it had not been made with reloads in mind. Thus, some Colt users would file the pin so that was easy to remove, and the gun could then be reloaded just as fast as a Remington. I do not know if Fordyce Beals figured out the idea of a removable attachment pin by noticing what Colt users were doing, or if Colt users got the idea of filing their pins after seeing the Remington Beals revolvers.

### Single-shot rifles

As I described in a previous post, the American colonists switched from matchlock firearms to flintlocks much sooner than their European cousins did. Because a flintlock is much easier to reload, the change quintupled the fire—at least in the hands of a proficient user—from no more than one shot per minute to five shots per minute.

Flintlock firearms started becoming much more powerful in 1787 when England's Henry Nock patented a new breechblock. Formerly, the touch hole had been located near the back of the main powder charge. Nock moved the touch hole to around the middle of the powder charge, so that all the powder would ignite at once. Greener at 118; George at 188-90. Because all the powder now burned in an instant, gun barrels could be shortened; there was no longer a need for long barrels that provided time of various parts of the powder to combust. George at 190.

Nock's breechblock was one of many inventions that made the flintlocks of 1787 much better than the flintlocks of 1687. George at 103 ("immense improvement in such matters as the cutting of screw threads, the tempering of springs, the case-hardening of working parts and lock-plates, and the accurate fitting of all members of the lock"); 114 ("waterproof" flash-pan allowing moisture to drain out the bottom); 115 ("small bearing-wheel" on the pan cover or pan cover spring that reduced friction and "greatly increased" the speed of opening the pan cover and "lessened the chances of its missing fire").

In the first decades of the 19th century, as percussion ignition became standard, retrofitting a flintlock to use percussion ignition was inexpensive and easy. With percussion ignition, the user no longer had to pour loose priming gunpowder into the firing pan; simply putting a cap on the nipple was much faster. So reloading became faster.

After experimentation, the best form of percussion ignition was determined to be the copper percussion cap, "shaped like a thimble and with a small charge of fulminate in the crown." George at 258. The cap sat on a nipple near the breech.

The retrofit instantly made a firearm more reliable and powerful. Because the detonation of the fulminate instantly ignited all the gunpowder at once, the gun fired more powerfully. At the time, not everybody with a flintlock owned one with a Nock breechblock, which also ignited all the powder at once. Even with a Nock breechblock, there was sometimes a short delay between when the sparks landed in the firing pan and when main powder charge exploded, since the flame had to travel from the priming pan to the main powder charge. George at 246-48.

Unlike flintlocks, which had loose powder in the firing pan, a percussion cap gun was in little danger of not firing because of rain or heavy moisture. An 1834 British army test, conducted "in all types of weather," fired 6,000 rounds, and reported 936 misfires from flintlocks,

compared to only 22 from percussion locks. (At the time, "lock" was the term for what we today call the "action" of gun—the part of the gun that performs the mechanical operations of loading and firing.)

Moreover, as described above, in a flintlock the burning powder in the firing pan communicates with the main power charge via a touch hole in the barrel. Necessarily, some of the burning gas from the main powder charge would escape via the touch hole, rather than staying in the barrel to push the bullet out through the muzzle. When the flintlock touch hole was replaced with the percussion nipple, a path for rearward gas escape was eliminated. "The penetration and recoil are therefore proportionately increased." Greener at 117.

Meanwhile, breechloaders were becoming increasingly common. The vast majority of modern firearms are breechloaders. They load from the back of the barrel (the breech) rather than from the front of the barrel (the muzzle).

Of course, King Henry VIII had breechloaders in 1537. His armory included breechloading matchlock arquebus handguns and rifles. Upon examination centuries later, the guns "with some minor difference in details, were found to be veritable Snider rifles." Charles B. Norton, *American Breech-loading Small Arms* 10 (1872). Invented in 1865, the Snider rifle was the standard British service arm of 1866-74. Greener at 103-04.

But unlike Henry VIII's lever action and revolver guns, the breechloader became widespread well before the 19th century. "[M]any specimens" of breechloaders "may be seen in museums of ancient arms." Greener at 703. "During the seventeenth and eighteenth centuries, breech-loading arms were very numerous and of greatly diversified mechanism." *Id.* at 103-10 (quote at 105); see also George at 47. Among the most famous, at least to Americans, was the Ferguson rifle, which was used by the British in the American War of Independence and was "the first breech-loading carbine ever used by a regularly organized British corps." Greener at 108. The user could hit a 200 yard target with six shots per minute while stationary, or four shots per minute while walking and reloading—reloading on the move having hitherto been impossible. George at 149-50.

From an American perspective, the first highly popular breechloader was the 1848 Sharps single-shot rifle. It used percussion ignition, plus old-fashioned paper cartridges that contained the bullet and powder charge, but not the primer. A novice could fire and reload 9 shots per minute. *Sharps' Breech-loading Patent Rifle*, *Scientific American*, Mar. 9, 1850. The Sharps were especially popular with pioneer families heading West. Nine shots per minute by a novice was a big change from the flintlock's rate of five shots per minute by an experienced user.

But the biggest breakthrough for breechloaders was the invention of the modern metallic cartridge in 1853. As described above, it contains the bullet, powder charge, and primer in a single metal casing. A predecessor had been invented around 1810 by Samuel Johannes Pauly of Switzerland. Building on the invention of percussion ignition, Pauly put the fulminate inside a pan in the center of a short metal case. The Pauly case attached to the rear of a traditional paper cartridge (which contained the gunpowder and the bullet). The fulminate would be detonated when struck by a firing pin. (As opposed to the standard percussion cap, which was detonated when struck by a hammer.)

You might not be surprised to learn that Henry VIII also had guns that used metallic cartridges. For all breechloaders in every century, there was one fundamental problem that needed to be solved. Unlike with a muzzleloader, the breech of the breechloader must be opened every time new ammunition is inserted. Unless a perfect seal is created at the breech, some of the gas from the burning gunpowder will escape rearward. Whatever gas escapes rearward will be wasted, since it not used to impart forward energy to the bullet. The rear gas could be annoying to the user.

The solution was the metallic cartridge. If the case were precisely as wide as the bore of the barrel, then the case itself would create a gas seal—as Henry VIII's engineers well understood. It took a lot of trial and error to build a metal case that was precisely the size of the bore on the king's breechloaders. George at 17-18. A king could afford the very high labor cost of handcrafted ammunition built for a particular firearm, but few other people could. Even after machine tools greatly reduced variations in bore sizes in a given caliber, bore sizes still varied within a range of tolerance. Some breechloaders were designed with breechblocks that made a perfect gas seal, but over repeated use, the friction of metal moving against metal might eventually thin the metal and allow some gas to escape.

The metallic cartridge of 1853 was the answer. Unlike Henry VIII's ammunition, the 1853 cartridge used an *expansive* shell. This thin-walled shell could readily be dropped into the barrel breech. Then, when the gunpowder ignited, the pressure would expand the wall of the shell to release the bullet, and to form a perfect seal behind the expanding gas. "Probably no invention connected with fire-arms has wrought such changes in gun construction as the invention of the expansive cartridge case." Greener at 133.

The expansive metallic cartridge was greatly beneficial for repeating firearms. First, the mechanics of a repeater are simpler if the primer is contained in the cartridge, rather than having to be loaded separately.

Secondly, for repeating arms, especially if not correctly loaded, there was a risk of "chain fire." That is, the flame that was igniting one round might escape and ignite another round. At the least this could severely damage the gun, and at worst the explosion might injure the user. Today, if you have a reproduction of a 6-shot cap and ball revolver, the safety instructions may encourage you to load only every other round in the cylinder during target

practice, to reduce the risk of a chain fire. People who carried fully loaded cap and ball revolvers for defense presumably decided that the small risk of a chain fire was outweighed by the risk of running out of ammunition while under attack. With the metallic cartridge, the risk of chain fire was greatly reduced.

Even on a single-shot rifle, the expansive metallic cartridge was a game-changer because it sped up reloading. As stated in the 1859 annual report by U.S. War Department Chief of Ordnance Henry Craig, "With the best breech-loading arm, one skillful man would be equal to two, probably three, armed with an ordinary muzzle-loading gun." Carl Davis, *Arming the Union* 117 (1979).

Undoubtedly the Union could have won the Civil War much faster if it had been able to equip all its soldiers with breechloaders. But that was logistically impossible. With production lines running as fast as possible, it took until 1863—two years into the war—before the Union could supply every infantry soldier with the Army's then-standard arm, the muzzleloading Springfield Model 1848 rifle. Retooling all the muzzleloading production lines to convert them into breechloading was not possible, given the Army's immediate need for huge quantities of rifles. The Union had to make do with whatever breechloaders it could obtain from private companies and from imports. The Union's deficiency in very large-scale firearm production at hitherto unknown quantities was one reason so many Union soldiers brought their personal firearms to service.

Later, when the Army had reverted to its small peacetime size, the single-shot 1873 Springfield rifle was adopted as the standard service arm. According to tests by the Ordnance Department, "A practiced person can fire this arm from 12 to 13 times per minute, loading from the cartridge-box. (It has been fired from the shoulder at the rate of 25 times per minute from the cartridge-box)." Springfield Armory, *Description and Rules for the Management of the Springfield Rifle, Carbine, and Army Revolvers, Caliber 45* (Gov't Printing Off. 1887).

## Conclusion

During the nineteenth century, firearms that could be reloaded quickly after being emptied became widespread and affordable to a broad market. Many of the developments involved ideas that had been worked out centuries before, but had not become available to average consumers due to the high labor costs of artisanal manufacture before the industrial revolution.

# EXHIBIT 19



## THE HISTORY OF FIREARM MAGAZINES AND MAGAZINE PROHIBITIONS

*David B. Kopel\**

### I. INTRODUCTION

In recent years, the prohibition of firearms magazines has become an important topic of law and policy debate. This article details the history of magazines and of magazine prohibition. The article then applies the historical facts to the methodologies of leading cases that have looked to history to analyze the constitutionality of gun control laws.

Because ten rounds is an oft-proposed figure for magazine bans, Part II of the article provides the story of such magazines from the sixteenth century onward. Although some people think that multi-shot guns did not appear until Samuel Colt invented the revolver in the 1830s, multi-shot guns predate Colonel Colt by over two centuries.<sup>1</sup>

Especially because the Supreme Court's decision in *District of Columbia v. Heller*<sup>2</sup> considers whether arms are "in common use" and are "typically possessed by law-abiding citizens for lawful purposes,"<sup>3</sup> the article also pays attention to whether and when particular guns and their magazines achieved mass-market success in the United States. The first time a rifle with more than ten rounds of ammunition did so was in 1866,<sup>4</sup> and the first time a

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<sup>1</sup> See Clayton E. Cramer & Joseph Edward Olson, *Pistols, Crime, and Public Safety in Early America*, 44 WILLAMETTE L. REV. 699, 716 (2008).

<sup>2</sup> *District of Columbia v. Heller*, 554 U.S. 570 (2008).

<sup>3</sup> *Id.* at 624–25, 627.

<sup>4</sup> See *infra* notes 50–55 and accompanying text.



handgun did so was in 1935.<sup>5</sup>

The detailed history of various firearms and their magazines stops in 1979—a year which is somewhat ancient in terms of the current gun control debate. Back in 1979, revolvers still far outsold semiautomatic handguns.<sup>6</sup> No one was trying to ban so-called assault weapons,<sup>7</sup> although such guns were already well established in the market.<sup>8</sup>

For the post-1979 period, Part II briefly explains how technological improvements in recent decades have fostered the continuing popularity of magazines holding more than ten rounds

Part III of the article describes the history of magazine prohibition in the United States. Such prohibitions are of recent vintage, with an important exception: during prohibition, Michigan, Rhode Island, and the District of Columbia banned some arms that could hold more than a certain number of rounds; Ohio required a special license for such guns.<sup>9</sup> The Michigan and Rhode Island bans were repealed decades ago; the Ohio licensing law was repealed in 2014, having previously been modified and interpreted so that it banned no magazines.<sup>10</sup> The District of Columbia ban, however, remains in force today, with some revisions.<sup>11</sup>

The Supreme Court's Second Amendment decisions in *District of Columbia v. Heller* and *McDonald v. Chicago*<sup>12</sup> paid careful

<sup>5</sup> See *infra* notes 102–03 and accompanying text.

<sup>6</sup> The U.S. manufacturing figures were compiled by the Bureau of Alcohol, Tobacco & Firearms. Although they were public documents, they were not made widely available in the 1970s. The following are the full-year production data by U.S. manufacturers. The figures do not include production for sale to the military. 1973: 452,232 pistols, 1,170,966 revolvers; 1974: 399,011 pistols, 1,495,861 revolvers; 1975: 455,267 pistols, 1,425,833 revolvers; 1976: 468,638 pistols, 1,425,407 revolvers; 1977: 440,387 pistols, 1,423,984 revolvers; 1978: 499,257 pistols, 1,458,013 revolvers; 1979: 637,067 pistols, 1,531,362 revolvers; 1980: 785,105 pistols, 1,586,149 revolvers. *Statistical Tabulation of Firearms Manufactured in the United States—and Firearms Exported—as Reported Yearly by Bureau of Alcohol, Tobacco and Firearms on ATF Form 4483-A*, AM. FIREARMS INDUSTRY (Nov. 1981) at 28–29.

<sup>7</sup> See David B. Kopel, *The Great Gun Control War of the Twentieth Century—and Its Lessons for Gun Laws Today*, 39 FORDHAM URB. L.J. 1527, 1578–79 (2012) (beginning of “assault weapon” issue in the mid- and late 1980s); L. Ingram, *Restricting of Assault-Type Guns Okd by Assembly Unit*, L.A. TIMES, Apr. 9, 1985, at 3.

<sup>8</sup> Below, this article describes many models of semi-automatic rifles introduced since 1927. See *infra* notes 82–101 and accompanying text. All of them have been labeled an “assault weapon” by one or more proposed bills. See, e.g., LEGAL CMTY. AGAINST VIOLENCE, BANNING ASSAULT WEAPONS—A LEGAL PRIMER FOR STATE AND LOCAL ACTION 59–60 (2004), available at [http://smartgunlaws.org/wp-content/uploads/2012/05/Banning\\_Assault\\_Weapons\\_A\\_Legal\\_Primer\\_8.05\\_entire.pdf](http://smartgunlaws.org/wp-content/uploads/2012/05/Banning_Assault_Weapons_A_Legal_Primer_8.05_entire.pdf) (proposing a model assault weapons law).

<sup>9</sup> See *infra* notes 129–30, 134, 140 and accompanying text.

<sup>10</sup> See *infra* notes 131–33, 135–39 and accompanying text.

<sup>11</sup> See *infra* notes 140–45 and accompanying text.

<sup>12</sup> *McDonald v. City of Chi.*, 561 U.S. 742 (2010).

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attention to history. Several post-*Heller* lower court opinions in Second Amendment cases have also examined history as part of their consideration of the constitutionality of gun control statutes. Part IV of this article examines the legality of magazine bans according to the various historical standards that courts have employed.

## II. THE HISTORY OF MAGAZINES HOLDING MORE THAN TEN ROUNDS

In *District of Columbia v. Heller*, the Supreme Court ruled that the District of Columbia's handgun ban was unconstitutional partly because handguns are in "common use."<sup>13</sup> The Second Amendment protects arms that are "typically possessed by law-abiding citizens for lawful purposes."<sup>14</sup>

Magazines of more than ten rounds are older than the United States.<sup>15</sup> Box magazines date from 1862.<sup>16</sup> In terms of large-scale commercial success, rifle magazines of more than ten rounds had become popular by the time the Fourteenth Amendment was being ratified.<sup>17</sup> Handgun magazines of more than ten rounds would become popular in the 1930s.<sup>18</sup>

### A. *Why Consumers Have Always Sought to Avoid Having to Reload During Defensive Gun Use*

When a firearm being used for defense is out of ammunition, the defender no longer has a functional firearm. The Second Amendment, of course, guarantees the right to an *operable* firearm.<sup>19</sup> As the *Heller* Court explained, the Council of the District of Columbia could not require that lawfully-possessed guns be kept in an inoperable status (locked or disassembled) in the home, because doing so negates their utility with respect to "the core lawful purpose of self-defense."<sup>20</sup>

When the defender is reloading, the defender is especially vulnerable to attack. When ammunition is low but not exhausted (e.g., two or three rounds remaining), that may be insufficient to

<sup>13</sup> *District of Columbia v. Heller*, 554 U.S. 570, 627–29 (2008).

<sup>14</sup> *Id.* at 625.

<sup>15</sup> See *infra* notes 21–24 and accompanying text.

<sup>16</sup> See *infra* note 65 and accompanying text.

<sup>17</sup> See *infra* notes 43–55, 172–73 and accompanying text.

<sup>18</sup> See *infra* notes 102–03 and accompanying text.

<sup>19</sup> See *Heller*, 554 U.S. at 630, 635 (declaring the District of Columbia's requirement that all firearms in the home be "rendered and kept inoperable at all times" as unconstitutional).

<sup>20</sup> *Id.*

deter or control the threat, especially if the threat is posed by more than one criminal. If the victim is attacked by a gang of four large people, and a few shots cause the attackers to pause, the victim needs enough reserve ammunition in the firearm to make the attackers worry that even if they rush the victim all at once, the victim will have enough ammunition to knock each attacker down. When guns are fired defensively, it is unusual for a single hit to immediately disable an attacker.

Accordingly, from the outset of firearms manufacturing, one constant goal has been to design firearms able to fire more rounds without reloading.

To this end, manufacturers have experimented with various designs of firearms and magazines for centuries. While not all of these experiments were successful in terms of mass sales, they indicated the directions where firearms development was proceeding. The first experiments to gain widespread commercial success in the United States came around the middle of the nineteenth century.

### *B. Magazines of Greater than Ten Rounds are More than Four Hundred Years Old*

The first known firearm that was able to fire more than ten rounds without reloading was a sixteen-shooter created around 1580, using “superposed” loads (each round stacked on top of the other).<sup>21</sup> Multi-shot guns continued to develop in the next two centuries, with such guns first issued to the British army in 1658.<sup>22</sup> One early design was the eleven-round “Defence Gun,” patented in 1718 by lawyer and inventor James Puckle.<sup>23</sup> It used eleven preloaded cylinders; each pull of the trigger fired one cylinder.<sup>24</sup>

As with First Amendment technology (such as televisions or websites), the Second Amendment is not limited to the technology that existed in 1791.<sup>25</sup> The *Heller* Court properly described such an asserted limit as “bordering on the frivolous.”<sup>26</sup> But even if *Heller*

<sup>21</sup> See LEWIS WINANT, FIREARMS CURIOSA 168–70 (2009); *A 16-Shot Wheel Lock*, AMERICA’S 1ST FREEDOM (June 2014), <http://www.nrapublications.org/index.php/17739/a-16-shot-wheel-lock/> (NRA member magazine).

<sup>22</sup> Cramer & Olson, *supra* note 1, at 716.

<sup>23</sup> *Id.* at 716 & n.94.

<sup>24</sup> See *id.* at 716–17; *This Day in History: May 15, 1718*, HISTORY, <http://www.historychannel.com.au/classroom/day-in-history/600/defence-rapid-fire-gun-patented> (last visited Feb. 21, 2015).

<sup>25</sup> *Heller*, 544 U.S. at 582.

<sup>26</sup> *Id.* (“Some have made the argument, bordering on the frivolous, that only those arms in

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had created such a rule, magazines of more than ten rounds are older than the Second Amendment.

At the time that the Second Amendment was being ratified, the state of the art for multi-shot guns was the Girandoni air rifle, with a twenty-two-shot magazine capacity.<sup>27</sup> Meriwether Lewis carried a Girandoni on the Lewis and Clark expedition.<sup>28</sup> At the time, air guns were ballistically equal to powder guns in terms of bullet size and velocity.<sup>29</sup> The .46 and .49 caliber Girandoni rifles were invented around 1779 for use in European armies and were employed by elite units.<sup>30</sup> One shot could penetrate a one-inch thick wood plank or take down an elk.<sup>31</sup>

*C. The Nineteenth Century Saw Broad Commercial Success for  
Magazines Holding More than Ten Rounds*

Firearm technology progressed rapidly in the 1800s. Manufacturers were constantly attempting to produce reliable firearms with greater ammunition capacities for consumers. One notable step came in 1821 with the introduction of the Jennings multi-shot flintlock rifle, which, borrowing the superposed projectile design from centuries before, could fire twelve shots before reloading.<sup>32</sup>

Around the same time, pistol technology also advanced to permit more than ten shots being fired without reloading. “Pepperbox”

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existence in the 18th century are protected by the Second Amendment. We do not interpret constitutional rights that way. Just as the First Amendment protects modern forms of communications, and the Fourth Amendment applies to modern forms of search, the Second Amendment extends, *prima facie*, to all instruments that constitute bearable arms, even those that were not in existence at the time of the founding.” (citations omitted)).

<sup>27</sup> JIM SUPICA ET AL., TREASURES OF THE NRA NATIONAL FIREARMS MUSEUM 31 (2013).

<sup>28</sup> JIM GARRY, WEAPONS OF THE LEWIS & CLARK EXPEDITION 94 (2012).

<sup>29</sup> JOHN L. PLASTER, THE HISTORY OF SNIPING AND SHARPSHOOTING 69–70 (2008).

<sup>30</sup> See SUPICA ET AL., *supra* note 27, at 31.

<sup>31</sup> *Id.* The Lewis and Clark gun is on display at the National Rifle Association’s Sporting Arms Museum in Springfield, Missouri. Mark Yost, *The Story of Guns in America*, WALL ST. J., Sept. 3, 2014, at D5.

<sup>32</sup> NORM FLAYDERMAN, FLAYDERMAN’S GUIDE TO ANTIQUE AMERICAN FIREARMS AND THEIR VALUES 683 (9th ed. 2007) [hereinafter FLAYDERMAN’S GUIDE]. According to James S. Hutchins, historian emeritus at the National Museum of American History, Smithsonian Institution, Mr. Flayderman has been a “revered expert in antique American arms and a vast range of other Americana for half a century . . . .” James S. Hutchins, *Foreword* to NORM FLAYDERMAN, THE BOWIE KNIFE: UNSHEATHING THE AMERICAN LEGEND 7 (2004). Mr. Flayderman has been appointed as historical consultant to the U.S. Army Museum, U.S. Marine Corps Museum, and the State of Connecticut’s historic weapons collections. Andrea Valluzzo, *E. Norman Flayderman, 84; Antique Arms Expert*, ANTIQUES & ARTS WKLY. (July 2, 2013), <http://test.antiquesandthearts.com/node/185567#.VMvRAGjF8YM>.

pistols began to be produced in America in the 1830s.<sup>33</sup> These pistols had multiple barrels that would fire sequentially.<sup>34</sup> While the most common configurations were five or six shots,<sup>35</sup> some models had twelve independently-firing barrels,<sup>36</sup> and there were even models with eighteen or twenty-four independently-firing barrels.<sup>37</sup> Pepperboxes were commercially successful and it took a number of years for Samuel Colt's revolvers (also invented in the 1830s) to surpass them in the marketplace.<sup>38</sup>

The 1830s through the 1850s saw a number of different firearm designs intended to increase ammunition capacity. In 1838, the Bennett and Haviland Rifle was invented; it was a rifle version of the pepperbox, with twelve individual chambers that were manually rotated after each shot.<sup>39</sup> This would bring a new chamber, preloaded with powder and shot, into the breach, ready to be fired.<sup>40</sup> Alexander Hall and Colonel Parry W. Porter each created rifles with capacities greater than ten in the 1850s.<sup>41</sup> Hall's design had a fifteen-shot rotating cylinder (similar to a revolver), while Porter's design used a thirty-eight-shot canister magazine.<sup>42</sup>

The great breakthrough, however, began with a collaboration of Daniel Wesson (of Smith and Wesson) and Oliver Winchester. They produced the first metallic cartridge—containing the gunpowder, primer, and ammunition in a metallic case similar to modern ammunition.<sup>43</sup> Furthermore, they invented a firearms mechanism that was well suited to the new metallic cartridge: the lever

<sup>33</sup> JACK DUNLAP, AMERICAN BRITISH & CONTINENTAL PEPPERBOX FIREARMS 16 (1964).

<sup>34</sup> LEWIS WINANT, PEPPERBOX FIREARMS 7 (1952).

<sup>35</sup> See, e.g., *Pocketsize Allen and Thurber Pepperbox Revolver*, ANTIQUE ARMS, <http://aaawt.com/html/firearms/f102.html> (last visited Feb. 21, 2015).

<sup>36</sup> DOE RUN LEAD COMPANY'S MUSEUM, CATALOGUE OF CONTENTS 66 (1912).

<sup>37</sup> DUNLAP, *supra* note 33, at 148–49, 167 (describing three European eighteen-shot models and one twenty-four-shot model); SUPICA ET AL., *supra* note 27, at 33 (describing the Marietta eighteen-shot model); WINANT, *supra* note 21, at 249–50 (describing a twenty-four-shot pepperbox).

<sup>38</sup> WINANT, *supra* note 34, at 28.

<sup>39</sup> FLAYDERMAN'S GUIDE, *supra* note 32, at 711.

<sup>40</sup> See *id.*

<sup>41</sup> *Id.* at 713, 716.

<sup>42</sup> *Id.* The Porter Rifle was said to be able to fire up to sixty shots per minute. Mary Moran, *P.W. Porter, Inventor of the Porter Rifle*, DEAD MEMPHIS TALKING (April 18, 2014), <http://deadmemphistalking.blogspot.com/2014/04/pw-porter-inventor-of-porter-rifle.html> (reprinting an article from New York Post). About 1250 of these guns were produced. S.P. Fjestad, *What's It Worth? The Porter Rifle*, FIELD & STREAM, <http://www.fieldandstream.com/articles/guns/rifles/2009/01/whats-it-worth-porter-rifle> (last visited Feb. 21, 2015).

<sup>43</sup> See FLAYDERMAN'S GUIDE, *supra* note 32, at 303 (“The self-contained cartridge was a special type, the hollowed out conical bullet containing the powder, and backed by the primer.”); HAROLD F. WILLIAMSON, WINCHESTER: THE GUN THAT WON THE WEST 26–27 (1952).

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action.<sup>44</sup> Their company, the Volcanic Repeating Arms Company, introduced the lever action rifle in 1855.<sup>45</sup> This rifle had up to a thirty-round tubular magazine under the barrel that was operated by manipulating a lever on the bottom of the stock.<sup>46</sup> The lever-action allowed a shooter to quickly expel spent cartridges and ready the firearm for additional shots.<sup>47</sup> An 1859 advertisement bragged that the guns could be loaded and fire thirty shots in less than a minute.<sup>48</sup> In 1862, the Volcanic evolved into the sixteen-round Henry lever action rifle, lauded for its defensive utility.<sup>49</sup>

The Henry rifle further evolved into the Winchester repeating rifle, and the market for these firearms greatly expanded with the first gun produced under the Winchester name.<sup>50</sup> Winchester touted the Model 1866 for defense against “sudden attack either from robbers or Indians.”<sup>51</sup> According to advertising, the M1866 “can . . . be fired thirty times a minute,”<sup>52</sup> or with seventeen in the magazine and one in the chamber, “eighteen charges, which can be fired in nine seconds.”<sup>53</sup> The gun was a particularly big seller in the American West.<sup>54</sup> There were over 170,000 Model 1866s produced.<sup>55</sup>

Next came the Winchester M1873, “[t]he gun that won the West.”<sup>56</sup> The Winchester M1873 and then the M1892 were lever actions holding ten to eleven rounds in tubular magazines.<sup>57</sup> There were over 720,000 copies of the Winchester 1873 made from 1873 to

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<sup>44</sup> See *Smith & Wesson History*, SMITH & WESSON, [http://www.smith-wesson.com/webapp/wcs/stores/servlet/Category4\\_750001\\_750051\\_757941\\_-1\\_757938\\_757812\\_image](http://www.smith-wesson.com/webapp/wcs/stores/servlet/Category4_750001_750051_757941_-1_757938_757812_image) (last visited Feb. 21, 2015).

<sup>45</sup> FLAYDERMAN’S GUIDE, *supra* note 32, at 304.

<sup>46</sup> *Id.* at 303; WILLIAMSON, *supra* note 43, at 13.

<sup>47</sup> WILLIAMSON, *supra* note 43, at 25. Oliver Winchester had an ownership interest in Volcanic and acquired the company in 1857. FLAYDERMAN’S GUIDE, *supra* note 32, at 300.

<sup>48</sup> WILLIAMSON, *supra* note 43, at 25.

<sup>49</sup> See *Id.*, at 28–31; Joseph Bilby, *The Guns of 1864*, AM. RIFLEMAN (May 5, 2014), <http://www.americanrifleman.org/articles/2014/5/5/the-guns-of-1864/>. About 14,000 Henry rifles were sold in 1860–66. FLAYDERMAN’S GUIDE, *supra* note 32, at 305. The Henry Rifle is still in production today. See *About Henry Repeating*, HENRY, <http://www.henryrifles.com/about-henry-repeating/> (last visited Feb. 21, 2015).

<sup>50</sup> See WILLIAMSON, *supra* note 43, at 49.

<sup>51</sup> R.L. WILSON, WINCHESTER: AN AMERICAN LEGEND 32 (1991).

<sup>52</sup> WILLIAMSON, *supra* note 43, at 49.

<sup>53</sup> LOUIS A. GARAVAGLIA & CHARLES G. WORMAN, FIREARMS OF THE AMERICAN WEST 1866–1894, at 128 (1985). The Winchester Model 1866 was produced until 1898. FLAYDERMAN’S GUIDE, *supra* note 32, at 306.

<sup>54</sup> WILSON, *supra* note 51, at 34.

<sup>55</sup> FLAYDERMAN’S GUIDE, *supra* note 32, at 306.

<sup>56</sup> *Model 1873 Short Rifle*, WINCHESTER REPEATING ARMS, <http://www.winchesterguns.com/products/catalog/detail.asp?family=027C&mid=534200> (last visited Feb. 21, 2015).

<sup>57</sup> *Id.*



1919.<sup>58</sup> Over a million of the M1892 were manufactured from 1892 to 1941.<sup>59</sup> The Italian company Uberti, which specializes in high-quality reproductions of western firearms, produces reproductions of all of the above Winchesters today.<sup>60</sup> Another iconic rifle of the latter nineteenth century was the pump action Colt Lightning rifle, with a fifteen-round capacity.<sup>61</sup>

Manufactured in Maine, the Evans Repeating Rifle came on the market in 1873.<sup>62</sup> The innovative rotary helical magazine in the buttstock held thirty-four rounds.<sup>63</sup> It was commercially successful for a while, although not at Winchester's or Colt's levels. Over 12,000 copies were produced.<sup>64</sup>

Meanwhile, the first handgun to use a detachable box magazine was the ten-round Jarre harmonica pistol, patented in 1862.<sup>65</sup> In the 1890s, the box magazine would become common for handguns.<sup>66</sup>

Pin-fire revolvers with capacities of up to twenty or twenty-one entered the market in the 1850s;<sup>67</sup> they were produced for the next half-century, but were significantly more popular in Europe than in America.<sup>68</sup> For revolvers with other firing mechanisms, there were some models with more than seventeen rounds.<sup>69</sup> The twenty-round Josselyn belt-fed chain pistol was introduced in 1866, and various other chain pistols had even greater capacity.<sup>70</sup> Chain pistols did not win much market share, perhaps in part because the large

<sup>58</sup> FLAYDERMAN'S GUIDE, *supra* note 32, at 307. The Model 1873 was Pa Cartwright's gun on the 1959 to 1973 television series *Bonanza*. SUPICA ET AL., *supra* note 27, at 108.

<sup>59</sup> FLAYDERMAN'S GUIDE, *supra* note 32, at 311. The Model 1892 was John Wayne's gun in many movies. SUPICA ET AL., *supra* note 27, at 109.

<sup>60</sup> 2014 STANDARD CATALOG OF FIREARMS: THE COLLECTOR'S PRICE & REFERENCE GUIDE, 1237 (Jerry Lee ed., 2013). The 1995 edition of this annually-published guide was relied on by the court in *Kirkland v. District of Columbia*, 70 F.3d 629, 635 n.3 (D.C. Cir. 1995).

<sup>61</sup> The original Colt held up to fifteen rounds in calibers of .32-.20, .38-.40, and .44-.40. FLAYDERMAN'S GUIDE, *supra* note 32, at 122. Uberti currently produces a modern replica of the Colt Lightning, medium frame model, of which 89,000 were produced between 1884 and 1902. *Id.*

<sup>62</sup> *Id.* at 694.

<sup>63</sup> DWIGHT B. DEMERITT, JR., MAINE MADE GUNS & THEIR MAKERS 293-95 (rev. ed. 1997); FLAYDERMAN'S GUIDE, *supra* note 32, at 694. A later iteration of the rifle held twenty-five or twenty-eight rounds in the buttstock. DEMERITT, *supra*, at 301. The American Society of Arms Collectors endorses the Demeritt book as "the definitive work for historians and collectors" of Maine guns. DEMERITT, *supra*, at vi.

<sup>64</sup> FLAYDERMAN'S GUIDE, *supra* note 32, at 694.

<sup>65</sup> WINANT, *supra* note 21, at 244-45. The magazine stuck out horizontally from the side of the firing chamber, making the handgun difficult to carry in a holster, which perhaps explains why the gun never had mass success. SUPICA ET AL., *supra* note 27, at 33.

<sup>66</sup> See *infra* notes 72-77 and accompanying text.

<sup>67</sup> SUPICA ET AL., *supra* note 27, at 48-49; WINANT, *supra* note 21, at 67-70.

<sup>68</sup> SUPICA ET AL., *supra* note 27, at 49.

<sup>69</sup> See, e.g., WINANT, *supra* note 21, at 62-63, 207-08.

<sup>70</sup> *Id.* at 204, 206.

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dangling chain was such an impediment to carrying the gun.<sup>71</sup>

The semiautomatic firearm and its detachable box magazine were invented before the turn of the century. It was the latest success in the centuries-old effort to improve the reliability and capacity of multi-shot guns.

In 1896, Germany's Mauser introduced the C96 "broomhandle" pistol, which remained in production until the late 1930s, selling nearly a million to civilians worldwide.<sup>72</sup> The most common configuration was in ten-round capacity, but there were a variety of models with capacities as low as six or as high as twenty.<sup>73</sup> The latter was the Cone Hammer pistol, with twenty-round box magazine.<sup>74</sup>

The Luger semiautomatic pistol was brought to the market in 1899 (although it is commonly known as the "1900").<sup>75</sup> Through many variants, it was very popular for both civilians and the military markets, and remained in production for nearly a century.<sup>76</sup> The most common magazines were seven or eight rounds, but there was also a thirty-two-round drum magazine.<sup>77</sup>

*D. Manufacturers in the Twentieth Century Continued the Trend of Increasing Ammunition Capacity and Reliability for Civilian Firearms.*

The twentieth century saw improvements on the designs pioneered in the 1800s and expanding popularity for firearms with more than ten rounds.

<sup>71</sup> See *id.* at 205.

<sup>72</sup> JOHN W. BREATHED, JR. & JOSEPH J. SCHROEDER, JR., SYSTEM MAUSER, A PICTORIAL HISTORY OF THE MODEL 1896 SELF-LOADING PISTOL 272 (1967) (production of 1,150,000, of which "almost a million" were sold on the commercial, non-military market); see John Elliot, *A Sweeping History of the Mauser C96 Broomhandle Pistol*, GUNS.COM (Jan. 26, 2012), <http://www.guns.com/2012/01/26/a-sweeping-history-of-the-mauser-c96-broomhandle-pistol/>.

<sup>73</sup> 2014 STANDARD CATALOG OF FIREARMS, *supra* note 60, at 708–09.

<sup>74</sup> *Id.*; BREATHED & SCHROEDER, *supra* note 72, at 23, 30–31, 38–39, 54–55. At least between 1896 and 1905, Mauser's direct sales to the United States were small. *Id.* at 266–67.

Spain's Astra brought out its own versions of the Mauser, with several models having twenty-round magazines starting in 1928. *Id.* at 208. But these do not appear to have had much distribution in the United States. *Id.* at 266–67.

<sup>75</sup> See 2014 STANDARD CATALOG OF FIREARMS, *supra* note 60, at 650.

<sup>76</sup> Among the many models was the 1906 American Eagle. *Id.* at 653. George Luger's invention was licensed to many companies, including Mauser (Germany) and Vickers (England). *Id.* at 657–58. The gun was never manufactured under Luger's own name. See *id.* at 650–62.

<sup>77</sup> JEAN-NOËL MOURET, PISTOLS AND REVOLVERS 126–27 (1993); SUPICA ET AL., *supra* note 27, at 86.



Since the late 1890s, the Savage Arms Company has been one of the classic American firearms manufacturers.<sup>78</sup> In 1911, the company introduced their bolt-action Model 1911, a twenty-shot repeater with a tubular magazine in .22 short caliber.<sup>79</sup> The rifle was popular for boys and for shooting galleries.<sup>80</sup>

By the 1930s, American manufacturers such as Remington, Marlin, and Winchester were producing many tubular magazine rifles in .22 caliber.<sup>81</sup> These firearms are classic rifles for “plinking” (casual target shooting), especially popular for young people. Based on firearms catalogues from 1936 to 1971, there are over twenty such firearms models from major American manufacturers with magazines of sixteen to thirty rounds in one or more of the calibers.<sup>82</sup>

In 1927, the Auto Ordinance Company introduced their

<sup>78</sup> See *Savage Arms History*, SAVAGE ARMS, <http://www.savagearms.com/history/> (last visited Feb. 21, 2015).

<sup>79</sup> JIM PERKINS, *AMERICAN BOYS' RIFLES 1890–1945*, at 191 (1976).

<sup>80</sup> *Id.* Similarly, the Remington Model 12B Gallery Special was introduced in 1910, with an optional extended magazine that held twenty-five .22 shorts. ROY MARCOT, REMINGTON, “AMERICA’S OLDEST GUN MAKER” 149 (James W. Bequette & Joel J. Hutchcroft eds. 1998).

<sup>81</sup> See, e.g., 2014 STANDARD CATALOG OF FIREARMS, *supra* note 60, at 687–88, 870, 1343.

<sup>82</sup> Models listed in the 1936 *Shooter’s Bible* include; Remington Model 34 bolt action, Remington Model 121 slide action, Remington Model 341 bolt action, Stevens No. 71 slide action, Savage Model 5 bolt action, Stevens Model 76 semiauto, Stevens-Springfield Model 86 bolt action, Winchester Model 62 slide action, and Winchester Model 61 slide action. STOGER ARMS CORP., *SHOOTER’S BIBLE*, 1936, at 108–09, 112, 123–24, 126–27, 140 (photo. reprint 1974).

Some additional models include: Stevens Model 87 bolt action, Remington 550 semiauto, Mossberg Model 46B bolt action, Mossberg Model 46M bolt action, Winchester Model 74 semiautomatic, Marlin 39 A lever action, and Marlin Model 81 DL bolt action. BOB BROWNELL, 2 *THE GUNSMITHS MART*, 1949–1950, at 212, 214, 216, 218, 221 (2011) (reprinting article from *Hunting & Fishing*, Oct. 1948).

The 1959 annual edition of the *Shooter’s Bible* adds the semiautomatic Savage Model 6 to the above list. STOGER ARMS CORP., *SHOOTER’S BIBLE*, 1959, at 103 (1959). For some of the models previously mentioned, see *id.* at 80, 87, 91, 101.

Histories of Savage and Stevens firearms include the following not listed above: Stevens No. 66 bolt action, Stevens Model 46 bolt action, Model 1914 slide action, Savage Model 29 slide action, Savage Model 29 G slide action. JAY KIMMEL, *SAVAGE AND STEVENS ARMS COLLECTOR’S HISTORY* 35 (1990); BILL WEST, *SAVAGE AND STEVENS ARMS*, at 11–12, 13–8, 14–44, 15–10, 16–10 (1971). Savage purchased Stevens in 1920. *Savage Arms History*, *supra* note 78.

For use of the *Shooter’s Bible* by the courts, see *United States v. Olson*, No. 94-30387, 1995 U.S. App. LEXIS 36973, at \*1–2 (9th Cir. Dec. 15, 1995) (stating that the book was properly used as a source for a Bureau of Alcohol, Tobacco, and Firearms agent’s expert opinion); *United States v. Fisher*, 353 F.2d 396, 399 (5th Cir. 1965) (Gewin, J., dissenting) (considering information in the book to determine whether the evidence relied on by the trial court was sufficient to justify the trial court’s holding); *Potter v. United States*, 167 Ct. Cl. 28, 48 n.1 (Ct. Cl. 1964) (citing the book for the history of Gabilondo firearms); *United States v. Precise Imports Corp.*, 458 F.2d 1376, 1377 (C.C.P.A. 1972) (reviewing the record produced at the trial court, which included pages from the 1967 edition of the book).

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semiautomatic rifle that used thirty-round magazines.<sup>83</sup> These rifles are still in production today.<sup>84</sup>

The M-1 carbine was invented for the citizen soldier of World War II.<sup>85</sup> Thereafter, the M-1 carbine became and has remained a popular rifle for civilians in America.<sup>86</sup> The U.S. government's Civilian Marksmanship Program, created by Congress, put nearly a quarter million of these guns into the hands of law-abiding American citizens starting in 1963, at steeply-discounted prices.<sup>87</sup> Partly using surplus government parts, the Plainfield Machine Company, Iver Johnson, and more than a dozen other companies cumulatively manufactured over 200,000 for the civilian market, starting in the late 1950s.<sup>88</sup> The standard magazines are fifteen and thirty rounds.<sup>89</sup>

The most popular rifle in American history is the AR-15 platform, a semiautomatic rifle with standard magazines of twenty or thirty rounds.<sup>90</sup> The AR-15 was brought to the market in 1963, with a

<sup>83</sup> 2014 STANDARD CATALOG OF FIREARMS, *supra* note 60, at 84; *T1-C*, THOMPSON, [www.auto-ordnance.com/firearms/thompson-t1-c.asp](http://www.auto-ordnance.com/firearms/thompson-t1-c.asp) (last visited Feb. 21, 2015).

<sup>84</sup> See *T1-C*, *supra* note 83.

<sup>85</sup> See BRUCE N. CANFIELD, BRUCE CANFIELD'S COMPLETE GUIDE TO THE M1 GARAND AND THE M1 CARBINE 163 (1999).

<sup>86</sup> See *id.* at 163, 279 (noting high desirability and demand for the firearm after the war ended); see also Joseph P. Tartaro, *The Great Assault Weapon Hoax*, 20 U. DAYTON L. REV. 619, 622 (1995) ("[T]he M1 carbine [is] beloved by millions of war veterans, collectors, and recreational shooters.").

<sup>87</sup> CANFIELD, *supra* note 85, at 163; LARRY L. RUTH, 2 WAR BABY! COMES HOME: THE U.S. CALIBER .30 CARBINE 575 (R. Blake Stevens ed., 1993); *About the CMP*, CIV. MARKSMANSHIP PROGRAM, <http://thecmp.org/about/> (last visited Feb. 21, 2015).

<sup>88</sup> See CANFIELD, *supra* note 85, at 163, 279 (noting the large quantity of surplus carbine parts and that firms created commercial carbines using these parts in the 1950s and 1960s). The largest producers were Plainfield's 112,000 from 1962 to 1978 and Iver Johnson's 96,700 from 1978 to 1992. *Post WWII Commercially Manufactured M1 Carbines (U.S.A.): Iver Johnson Arms*, M1CARBINESINC.COM, [http://www.m1carbinesinc.com/carbine\\_ij.html](http://www.m1carbinesinc.com/carbine_ij.html) (last visited Feb. 21, 2015); *Post WWII Commercially Manufactured M1 Carbines (U.S.A.): Plainfield Machine Co., Inc.*, M1CARBINESINC.COM., [http://www.m1carbinesinc.com/carbine\\_plainfield.html](http://www.m1carbinesinc.com/carbine_plainfield.html) (last visited Feb. 21, 2015). The U.S. Government sold 240,000 of its own surplus in 1963 into the Civilian Marksmanship Program. CANFIELD, *supra* note 85, at 163. Thereafter, the program (then known as "DCM"—Director of Civilian Marksmanship) sold M1s to Americans from the supply of World War II M1 carbines that had been exported to allied nations and subsequently returned to the United States when the allied nation switched to a newer type of rifle. See RUTH, *supra* note 87, at 575, 723. As of 2014, the Civilian Marksmanship Program's supply of carbines for sale has been exhausted. *M1 Carbine*, CIV. MARKSMANSHIP PROGRAM, <http://www.thecmp.org/Sales/carbine.htm> (last visited Feb. 21, 2015).

<sup>89</sup> RUTH, *supra* note 87, at 575.

<sup>90</sup> See NICHOLAS J. JOHNSON, DAVID B. KOPEL, GEORGE A. MOCSARY & MICHAEL P. O'SHEA, FIREARMS LAW AND THE SECOND AMENDMENT: REGULATION, RIGHTS, AND POLICY 12, 809 (2012) (noting the wide range of uses for the gun and its popularity). The "AR" stands for "ArmaLite Rifle." *Modern Sporting Rifle Facts*, NAT'L SHOOTING SPORTS FOUND., <http://www.nssf.org/msrf/facts.cfm> (last visited Feb. 21, 2015). ArmaLite did the initial design work on

then-standard magazine of twenty; the thirty-round standard magazine was developed a few years later.<sup>91</sup> The 1994 Supreme Court case *Staples v. United States*<sup>92</sup> described the AR-15 as “the civilian version of the military’s M-16 rifle,” and noted that many parts are interchangeable between the two guns.<sup>93</sup> The crucial distinction, explained the Court, is that the AR-15 is like all other semiautomatic firearms in that it can fire “only one shot with each pull of the trigger.”<sup>94</sup> The Court pointed out that semiautomatic firearms “traditionally have been widely accepted as lawful possessions.”<sup>95</sup> So legally speaking, the semiautomatic AR-15 is the opposite of the M-16 machine gun: “[C]ertain categories of guns—no doubt including the machineguns, sawed-off shotguns, and artillery pieces that Congress has subjected to regulation— . . . have the same quasi-suspect character we attributed to owning hand grenades . . . . But . . . guns falling outside those categories traditionally have been widely accepted as lawful possessions . . . .”<sup>96</sup>

By 1969, the AR-15 faced competition from the Armalite-180 (twenty-round optional magazine), the J&R 68 carbine (thirty rounds), and the Eagle Apache carbine (thirty rounds).<sup>97</sup>

Springfield Armory brought out the M1A semiautomatic rifle in 1974, with a twenty-round detachable box magazine.<sup>98</sup> The next year, the Ruger Mini-14 rifle was introduced, with manufacturer-supplied standard five, ten, or twenty-round detachable magazines.<sup>99</sup> Both the M1A and the Mini-14 are very popular to this day.<sup>100</sup>

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the AR-15 before selling the rights to Colt’s. ARMALITE, INC., A HISTORICAL REVIEW OF ARMALITE 3 (Jan. 4, 2010), available at <http://www.armalite.com/images/Library%5CHistory.pdf>.

<sup>91</sup> PATRICK SWEENEY, THE GUN DIGEST BOOK OF THE AR-15, at 104 (2005). About this time, the Cetme-Sport semiauto rifle with an optional twenty-round detachable box mag magazine came on the market. GUN DIGEST 1968, at 335 (John T. Amber ed., 22nd Anniversary Deluxe ed. 1967).

<sup>92</sup> *Staples v. United States*, 511 U.S. 600 (1994).

<sup>93</sup> *Id.* at 603.

<sup>94</sup> *Id.* at 602 n.1, 603.

<sup>95</sup> *See id.* at 612.

<sup>96</sup> *See id.* at 611–12.

<sup>97</sup> *See* GUN DIGEST 1970, at 294 (John T. Amber ed., 24th Anniversary Deluxe ed. 1969).

<sup>98</sup> *See* 2014 STANDARD CATALOG OF FIREARMS, *supra* note 60, at 1102 (noting the twenty-round box magazine); *M1A Series*, SPRINGFIELD ARMORY, <http://www.springfield-armory.com/m1a-series/> (last visited Feb. 21, 2015).

<sup>99</sup> 2014 STANDARD CATALOG OF FIREARMS, *supra* note 60, at 1173.

<sup>100</sup> *See* M1A Scout, *What is an M1A Rifle*, M1A RIFLES (July 2, 2009), <http://www.m1arifles.com/tag/m14/>; Shawn Skipper, *8 Things You Might Not Know About the Ruger Mini-14*, DAILY CALLER (June 3, 2014), <http://dailycaller.com/2014/06/03/8-things-you-might-not-know->

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By 1979, all of the above guns were challenged in the American market by high-quality European imports such as the Belgian FN-FAL Competition rifle (optional twenty-round magazine), the German Heckler & Koch HK-91 and HK-93 rifles (twenty rounds), the Swiss SIG AMT rifle (twenty rounds), and the Finnish Valmet M-71S rifle (thirty rounds).<sup>101</sup>

Citizen firearms with detachable magazines holding more than ten rounds were not limited to rifles, however. In 1935, Browning introduced the Hi-Power pistol.<sup>102</sup> This handgun was sold with a thirteen-round detachable magazine and is still in production.<sup>103</sup>

In Europe, more so than in America, Browning had to compete against the Spanish Gabilondo twenty-round Plus Ultra, introduced in 1925.<sup>104</sup> Spain's Arostegui, Eulogio brought out the Azul—a semiautomatic with standard magazines of ten, twenty and thirty—in 1935.<sup>105</sup>

Browning's first notable American competition came with the 1964 introduction of the Plainfield Machine Company's "Enforcer," a pistol version of the M1 carbine with a thirty-round magazine.<sup>106</sup>

A tremendous commercial success was the Beretta model 92, a nine millimeter pistol with a sixteen-round magazine, which entered the market in 1976.<sup>107</sup> In various configurations (currently the Beretta 92F) the Beretta is one of the most popular of all modern handguns.<sup>108</sup> Browning introduced another popular handgun in 1977, the fourteen-round BDA (Browning Double Action).<sup>109</sup> Also coming on the market at this time were European handguns such as Austria's L.E.S. P-18 (eighteen rounds) and

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about-the-ruger-mini-14/. Another gun introduced in 1976 also used magazines larger than fifteen. The Bingham company (from Norcross, Georgia) brought out the PPS 50 and AK-22, .22 caliber rifles with detachable magazines of fifty or twenty-nine rounds. 2014 STANDARD CATALOG OF FIREARMS, *supra* note 60, at 163. The PPS-50 is currently manufactured by Mitchell's Mausers. See PPS-50/22, MITCHELL'S MOUSERS, <http://www.mauser.org/pps-50-22/> (last visited Feb. 21, 2015). That the gun is still in production four decades later is impressive, but the PPS-50 never became an all-American favorite as did the M1, AR-15, M1A and the Mini-14.

<sup>101</sup> GUN DIGEST 1980, at 319–21 (Ken Warner ed., 34th Anniversary Deluxe ed. 1979). Also on the market were the Commando Arms carbine (five, fifteen, thirty or ninety rounds), and the Wilkinson Terry carbine (thirty-one rounds). *Id.* at 319, 322.

<sup>102</sup> 2014 STANDARD CATALOG OF FIREARMS, *supra* note 60, at 182.

<sup>103</sup> *Id.* at 432–33.

<sup>104</sup> See *id.* at 465.

<sup>105</sup> *Id.* at 72; BREATHED & SCHROEDER, *supra* note 74, at 216–17.

<sup>106</sup> See GUN DIGEST 1965, at 229 (John T. Amber eds., 19th Anniversary Deluxe ed. 1964).

<sup>107</sup> 2014 STANDARD CATALOG OF FIREARMS, *supra* note 60, at 121.

<sup>108</sup> *Id.* at 122. In 1985 the M9 version of this pistol became the standard U.S. military issue sidearm. *Id.* at 124.

<sup>109</sup> *Id.* at 184.

Germany's Heckler & Koch VP 70Z (also eighteen rounds).<sup>110</sup>

### *E. Magazines After 1979*

We end this story in 1979, when Jimmy Carter was President,<sup>111</sup> the Bee Gees bestrode the AM radio Top 40,<sup>112</sup> Gaston Glock was manufacturing curtain rods in his garage,<sup>113</sup> Americans were watching *Love Boat* on broadcast television,<sup>114</sup> and people on the cutting edge of technology were adopting VisiCalc, the first spreadsheet program, run from huge floppy discs.<sup>115</sup>

Long before 1979, magazines of more than ten rounds had been well established in the mainstream of American gun ownership. Indeed, they had been so established before almost everyone alive in 1979 was born.

After 1979, technological improvements continued to foster the popularity of magazines holding more than ten rounds. First of all, there were improvements across the board in manufacturing, so that magazine springs became more reliable, particularly for magazines holding up to thirty rounds. This greatly reduced the risk of a misfeed. Reliability was also enhanced by improvements in shaping the magazines' "lips"—the angled wings at the top of the magazine which guide the next round of ammunition into the firing chamber.<sup>116</sup>

Magazines of all sizes benefited from increasing use of plastic polymers in manufacturing.<sup>117</sup> Today, many magazine walls are

<sup>110</sup> See GUN DIGEST 1980, *supra* note 101, at 297–98. L.E.S. was the American partner of Austria's Steyr. The following courts have relied on one of the annual issues of GUN DIGEST: *Sturm, Ruger & Co. v. Arcadia Mach. & Tool, Inc.*, No. CV 85-8459 MRP, 1988 U.S. Dist. LEXIS 16451, at \*3–4 (C.D. Cal. Nov. 4, 1988); *A. Uberti & C. v. Leonardo*, 892 P.2d 1354, 1364 (Ariz. 1995) (discussing how the inclusion of the defendant's guns in the *Gun Digest* established that defendant had sufficient minimum contacts with the state to satisfy personal jurisdiction); *Couplin v. State*, 378 A.2d 197, 202 n.2 (Md. Ct. Spec. App. 1977); *Citizens for a Safer Cmty. v. City of Rochester*, 627 N.Y.S.2d 193, 203 n.5 (Sup. Ct. 1994).

<sup>111</sup> JULIAN E. ZELIZER, *JIMMY CARTER* 3 (2010).

<sup>112</sup> See DAVID N. MEYER, *THE BEE GEES: THE BIOGRAPHY* 213–14 (2013).

<sup>113</sup> PAUL M. BARRETT, *GLOCK: THE RISE OF AMERICA'S GUN* 13–16 (2012).

<sup>114</sup> GAVIN MACLEOD & MARK DAGOSTINO, *THIS IS YOUR CAPTAIN SPEAKING: MY FANTASTIC VOYAGE THROUGH HOLLYWOOD, FAITH & LIFE* 138–39 (2013).

<sup>115</sup> See, e.g., BOB DENTON, *THE PC PIONEERS* 97–100 (2d ed. 2014); ROBERT E. WILLIAMS & BRUCE J. TAYLOR, *THE POWER OF: VISICALC* (1981) (advising how to properly use the VisiCalc system and providing practice exercises on the system).

<sup>116</sup> See generally David Tong, *The Care, Feeding and Reliability of Semi-Automatic Pistols*, CHUCKHAWKS.COM, [http://www.chuckhawks.com/care\\_reliability\\_autopistols.htm](http://www.chuckhawks.com/care_reliability_autopistols.htm) (last visited Feb. 21, 2015).

<sup>117</sup> See, e.g., Tim Lau, *AR15/M16 Magazine Drop Test: Plastic Vs. Aluminum*, MODERN SERVICE WEAPONS, (Dec. 9, 2012), <http://modernserviceweapons.com/?p=1072> (comparing the performance of plastic and aluminum magazines).

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made from plastic, rather than metal. Closer tolerances in manufacturing, lower costs, and increased durability have all improved magazine quality and reliability.

Likewise, the vast majority of magazines today have a removable baseplate (also known as a “foot plate”).<sup>118</sup> Removal of the baseplate allows the magazine to be disassembled for cleaning (e.g., removal of gunpowder residue) or repair (e.g., replacing a worn-out spring).<sup>119</sup> The existence of a removable baseplate also makes it possible for consumers to add after-market extenders to a magazine.<sup>120</sup> These extenders may simply increase the grip length (to better fit a particular consumer’s hands), and they may also increase capacity by one, two, or three rounds.<sup>121</sup> Thus, a consumer with a ten-round factory magazine can add a two-rounder extender to create a twelve-round magazine.

Most importantly, the double-stack magazine was perfected. In some box magazines, the ammunition is contained in a single column.<sup>122</sup> In the double-stack magazine, there are two columns of ammunition, side-by-side and touching.<sup>123</sup> When the gun is used, the magazine will first reload a round from column A, then a round from column B, then from column A, and so on.<sup>124</sup>

The practical effect is this: for a handgun, a single stack magazine of seventeen rounds would stick out far below the bottom of the grip, making the gun unwieldy for carrying and holstering. With a double-stack configuration, a seventeen-round magazine can fit inside a standard full-sized handgun grip. The practical limitation of grip size (the size of the human hand) means that relatively larger capacity magazines are possible for relatively smaller cartridges. Thus, a double-stack magazine for the midsize nine millimeter round might hold up to twenty or twenty-one rounds, whereas a double-stack for the thicker .45 ACP cartridge would hold

<sup>118</sup> Michael Shain, Expert Report and Opinion at 5–6, *Cooke v. Hickenlooper*, No. 13-cv-01300-MSK-MJW (D. Colo. Aug. 1, 2013), available at <http://coloradoguncase.org/Shain-report.pdf>. Kopel is counsel for the Colorado Sheriffs who are the plaintiffs in this case, which is currently on appeal to the Tenth Circuit.

<sup>119</sup> See Mike Wood, *3 Simple Keys to Cleaning Your Pistol Magazines*, POLICEONE.COM, July 11, 2014, <http://www.policeone.com/Officer-Safety/articles/7358758-3-simple-keys-to-cleaning-your-pistol-magazines/>.

<sup>120</sup> Michael Shain, Expert Report and Opinion at 5–7, *Cooke*, No. 13-cv-01300-MSK-MJW.

<sup>121</sup> See, e.g., *Magazine Adapters*, TOP GUN SUPPLY, <http://www.topgunsupply.com/gun-accessories-for-sale/magazine-adapters.html> (last visited Feb. 19, 2014) (selling magazine adapters that increase capacity and/or increase grip length).

<sup>122</sup> *Magazines, Clips, and Speedloaders*, FIREARMS ADVANTAGE, [http://www.firearmsadvantage.com/magazines\\_clips\\_speedloaders.html](http://www.firearmsadvantage.com/magazines_clips_speedloaders.html) (last visited Feb. 21, 2015).

<sup>123</sup> *Id.*

<sup>124</sup> *Id.*



no more than fifteen.

### III. THE HISTORY OF AMMUNITION CAPACITY BANS

An important factor in the consideration of the constitutionality of firearms laws is whether they are traditional and longstanding. For example, the *Heller* Court pointed out that “[f]ew laws in the history of our Nation have come close to the severe restriction of the District’s handgun ban.”<sup>125</sup> The handgun ban was contrasted with “longstanding” guns controls, such as those prohibiting gun possession by felons or the mentally ill.<sup>126</sup> Following *Heller*, the Tenth Circuit has explained that Second Amendment cases must consider “the rarity of state enactments in determining whether they are constitutionally permissible.”<sup>127</sup>

At the time the Second Amendment was adopted, there were no laws restricting ammunition capacity. This was not because all guns were single-shot. As detailed above, multi-shot guns predate the Second Amendment by about two hundred years, and Lewis and Clark carried a powerful twenty-two-round gun on their famous expedition.<sup>128</sup>

The first laws that restricted magazine capacity were enacted during the prohibition era, nearly a century and a half after the Second Amendment was adopted, and over half a century after the adoption of the Fourteenth Amendment. In 1927, Michigan prohibited “any machine gun or firearm which can be fired more than sixteen times without reloading.”<sup>129</sup> Also in 1927, Rhode Island banned “any weapon which shoots more than twelve shots semi-automatically without re-loading.”<sup>130</sup>

The Michigan ban was repealed in 1959.<sup>131</sup> That same year, the

<sup>125</sup> District of Columbia v. Heller, 554 U.S. 570, 629 (2008).

<sup>126</sup> *Id.* at 626, 629.

<sup>127</sup> Kerr v. Hickenlooper, 744 F.3d 1156, 1178 (10th Cir. 2014).

<sup>128</sup> See *supra* notes 21–31 and accompanying text.

<sup>129</sup> Act of June 2, 1927, No. 373, § 3, 1927 Mich. Public Acts 887, 888 (repealed 1959) (“It shall be unlawful within this state to manufacture, sell, offer for sale, or possess any machine gun or firearm which can be fired more than sixteen times without reloading . . .”). In 1931, the provision was consolidated into section 224 of the Michigan Code.

<sup>130</sup> Act of Apr. 22, 1927, ch. 1052, §§ 1, 4, 1927 R.I. Acts & Resolves 256, 256–57 (amended 1959).

<sup>131</sup> Under the 1959 revision: “Any person who shall manufacture, sell, offer for sale or possess any machine gun or firearm which shoots or is designed to shoot automatically more than 1 shot without manual reloading, by a single function of the trigger . . . shall be guilty of a felony . . .” Act of July 16, 1959, No. 175, sec. 1, § 224, 1959 Mich. Pub. Acts 249, 250. Michigan’s current statute on machine guns contains very similar language. See MICH. COMP. LAWS SERV. § 750.224 (LexisNexis 2014) (“A person shall not manufacture, sell, offer

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Rhode Island law was changed to fourteen shots, and .22 caliber rimfire guns were excluded.<sup>132</sup> The Rhode Island ammunition capacity law was fully repealed in 1975.<sup>133</sup>

The two statutes applied only to firearms, with Rhode Island only for semiautomatics. Neither statute covered a magazine that was not inserted in a firearm.

In 1933, Ohio began requiring a special permit for the possession or sale of a semiautomatic firearm with an ammunition capacity of greater than eighteen rounds.<sup>134</sup> In 1971, during a recodification of the state criminal code, an exemption for .22 caliber was added, and for other calibers the limit was raised to thirty-two or more rounds.<sup>135</sup>

Significantly, the Ohio statute was interpreted to not ban the sale of any magazine or any gun, but to forbid the simultaneous purchase of a magazine and a compatible gun.<sup>136</sup> (Of course purchase was allowed if one has the special permit.)<sup>137</sup> With or without the permit, one could buy a sixty-round magazine in Ohio.<sup>138</sup> The licensing law was fully repealed in 2014.<sup>139</sup>

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for sale or possess . . . [a] machine gun or firearm that shoots or is designed to shoot automatically more than 1 shot without manual reloading, by a single function of the trigger.”).

<sup>132</sup> Firearms Act, ch. 75, secs. 11-47-2, -8, 1959 R.I. Acts & Resolves 260, 260, 263 (amended 1975).

<sup>133</sup> This was accomplished by changing the Firearms Act’s definition of “Machine gun” to mirror the federal definition:

[A]ny weapon which shoots, is designed to shoot, or can be readily restored to shoot, automatically more than one shot, without manual reloading, by a single function of the trigger. The term shall also include the frame or receiver of any such weapon, any combination of parts designed and intended for use in converting a weapon into a machinegun, and any combination of parts from which a machinegun can be assembled if such parts are in the possession or under the control of a person.

Firearms Act, ch. 278, sec. 1, § 11-47-2, 1975 R.I. Pub. Laws 738, 738–39, 742 (amended 1989). Rhode Island’s definition of machine gun was changed again in 1989. Act of July 10, 1989, ch. 542, sec. 7, § 11-47-2, 1989 R.I. Pub. Laws. 1371, 1375–76 (codified at R.I. GEN. LAWS ANN. § 11-47-2 (West 2014)).

<sup>134</sup> Act of Apr. 8, 1933, No. 166, sec. 1, §§ 12819-3, -4, 1933 Ohio Laws 189, 189 (amended 1972).

<sup>135</sup> Act of Dec. 22, 1972, No. 511, sec. 1, § 2923.11, 1972 Ohio Laws 1866, 1963; OHIO REV. CODE ANN. § 2923.11 (LexisNexis 2014).

<sup>136</sup> *Ohio: Disclaimer*, BUDSGUNSHOP.COM (July. 11, 2014), [http://www.budsgunshop.com/catalog/feeds/state\\_reg/ohio\\_restrictions.pdf](http://www.budsgunshop.com/catalog/feeds/state_reg/ohio_restrictions.pdf).

<sup>137</sup> OHIO REV. CODE ANN. § 2923.17.

<sup>138</sup> See, e.g., *Surefire 60-Round High-Capacity Magazine MAG5-60*, GANDER MTN., <http://www.gandermountain.com/modperl/product/details.cgi?pdesc=SureFire-60-Round-High-Capacity-Magazine-MAG5-60&i=447625> (last visited Feb. 21, 2015) (allowing online customers to arrange for pick-up of a SureFire 60-Round High-Capacity Magazine at any of nine Ohio stores).

<sup>139</sup> H.R. 234, 2013–2014 Leg., 130th Sess. § 2 (Ohio 2014) (enacted) (repealing relevant definition statute, and taking effect Mar. 23, 2015).



The only longstanding statute banning magazines is found in the District of Columbia. In 1932, Congress passed a District of Columbia law prohibiting the possession of a firearm that “shoots automatically or semiautomatically more than twelve shots without reloading.”<sup>140</sup> In contrast, when Congress enacted the National Firearms Act of 1934 to impose stringent regulations on machine guns, it chose to impose no restrictions on magazines.<sup>141</sup> When the District of Columbia achieved home rule in 1975,<sup>142</sup> the district council did not choose to repeal the law but instead promptly enacted the bans on handguns and on self-defense with any gun in the home,<sup>143</sup> which were later ruled unconstitutional by the Supreme Court in *Heller*.<sup>144</sup> The District of Columbia interpreted the magazine law so that it outlawed all detachable magazines and all semiautomatic handguns.<sup>145</sup> The District stands alone in its historical restriction of magazines.

The only widespread restriction on magazine capacity came in 1994 when Congress enacted a ban on new magazines holding more than ten rounds.<sup>146</sup> The law was in effect until 2004, at which point Congress allowed it to sunset.<sup>147</sup> The effects of this law were studied extensively in a series of U.S. Department of Justice reports authored by Doctor Christopher Koper and two others. The final report, issued in 2004, concluded: “there has been no discernible reduction in the lethality and injuriousness of gun violence, based on indicators like the percentage of gun crimes resulting in death or the share of gunfire incidents resulting in injury . . . .”<sup>148</sup> Further,

<sup>140</sup> Act of July 8, 1932, Pub. L. No. 72-275, §§ 1, 8, 47 Stat. 650, 650, 652.

<sup>141</sup> National Firearms Act, Pub. L. 73-474, 48 Stat. 1236 (1934).

<sup>142</sup> *D.C. Home Rule*, COUNCIL D.C., <http://dccouncil.us/pages/dc-home-rule> (last visited Feb. 21, 2015).

<sup>143</sup> See Firearms Control Regulations Act of 1975, No. 1-142, § 201, 23 D.C. Reg. 1091, 1097 (July 23, 1976).

<sup>144</sup> See *supra* notes 13–14, 19–20 and accompanying text.

<sup>145</sup> See VIVIAN S. CHU, DC GUN LAWS AND PROPOSED AMENDMENTS 5–6 (2011) (“Prior to *Heller*, the DC Code’s definition of ‘machine gun’ included ‘any firearm, which shoots, is designed to shoot or can be readily converted to shoot . . . semiautomatically, more than 12 shots without manual reloading.’ By virtue of this broad definition, any semiautomatic weapon that could shoot more than 12 shots without manual reloading, whether pistol, rifle, or shotgun, was deemed a ‘machine gun,’ and prohibited from being registered. It appears that under the District’s old definition, registration of a pistol was largely limited to revolvers.” (quoting D.C. Code § 7-2501.01(10) (LexisNexis 2008))).

<sup>146</sup> Violent Crime Control and Law Enforcement Act of 1994, Pub. L. 103-322, § 110103(a)–(b), 108 Stat. 1796, 1998–99.

<sup>147</sup> § 110105, 108 Stat. at 2000.

<sup>148</sup> CHRISTOPHER S. KOPER ET AL., AN UPDATED ASSESSMENT OF THE FEDERAL ASSAULT WEAPONS BAN: IMPACTS ON GUN MARKETS AND GUN VIOLENCE, 1994–2003, at 96 (2004), available at <https://www.ncjrs.gov/pdffiles1/nij/grants/204431.pdf>.

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“the ban has not yet reduced the use of [such magazines] in crime . . . .”<sup>149</sup> Doctor Koper noted also that state-level firearm bans have not had an impact on crime.<sup>150</sup>

In the modern era, only a few states have enacted magazine restrictions, starting with New Jersey’s 1990 ban on magazines over fifteen rounds.<sup>151</sup> That ban applies only to detachable box magazines for semiautomatic firearms.<sup>152</sup> A couple years later, Hawaii banned handgun magazines over twenty rounds, and later reduced that to ten.<sup>153</sup> Maryland in 1994 banned the sale or manufacture of magazines over twenty rounds; the ban did not affect possession, loans, acquisition, or importation.<sup>154</sup> The Maryland limit was reduced to ten in 2013.<sup>155</sup>

In 1999 California banned the sale of magazines over ten rounds but allowed grandfathered possession, and New York did the same in 2000.<sup>156</sup> (Currently, large capacity magazine bans in Colorado, Connecticut, and Massachusetts also have grandfather provisions, while New Jersey, the District of Columbia, and Hawaii do not.)<sup>157</sup> In 2013 New York removed grandfathering and reduced the limit to seven.<sup>158</sup> The seven-round limit was suspended shortly thereafter, since there are no seven-round magazines available for many guns.<sup>159</sup> Instead, the legislature forbade owners of ten-round magazines to load more than seven rounds.<sup>160</sup> This restriction was

<sup>149</sup> *Id.* at 2.

<sup>150</sup> *Id.* at 81 n.95.

<sup>151</sup> Act of May 30, 1990, ch. 32, §§ 2C:39-1(y), -3(j), 1990 N.J. Laws 217, 221, 235 (codified at N.J. STAT. ANN. § 2C:39-1(y), -3(j) (West 2014)).

<sup>152</sup> § 2C:39-1(y). There is an exemption for certain competitive target shooters. *Id.* § 2C:39-3(j).

<sup>153</sup> Act of June 29, 1992, ch. 286, sec. 3, § 134-8, 1992 Haw. Sess. Laws 740, 742 (codified at HAW. REV. STAT. ANN. § 134-8 (LexisNexis 2014)).

<sup>154</sup> Act of May 26, 1994, ch. 456, § 36H-5, 1994 Md. Laws 2119, 2165 (amended 2013).

<sup>155</sup> See Firearm Safety Act of 2013, ch. 427, § 4-305, 2013 Md. Laws 4195, 4210 (codified at MD. CODE ANN., CRIM. LAW § 4-305 (LexisNexis 2014)).

<sup>156</sup> See Act of July 19, 1999, ch. 129, sec. 3, § 12020(a)(2), (c)(25), 1999 Cal. Stat. 1781, 1785, 1793 (repealed 2012); Act of Aug. 8, 2000, ch. 189, sec. 11, § 265.02(8), 2000 N.Y. Laws 2788, 2793 (amended 2013).

<sup>157</sup> *Large Capacity Ammunition Magazines Policy Summary*, L. CENTER TO PREVENT GUN VIOLENCE (May 31, 2013), <http://smartgunlaws.org/large-capacity-ammunition-magazines-policy-summary/>; see *supra* notes 158, 165 and accompanying text.

<sup>158</sup> Act of Jan. 15, 2013, ch. 1, secs. 38, 46-a, §§ 265.00.23, 265.36, 2013 N.Y. Laws 1, 16, 19 (codified at N.Y. PENAL LAW § 265.36 (McKinney 2014)).

<sup>159</sup> Freeman Klopott, *Cuomo’s 7-Bullet Limit to Be Suspended Indefinitely, Skelos Says*, BLOOMBERG (Mar. 24, 2013), <http://www.bloomberg.com/news/2013-03-25/cuomo-s-7-bullet-limit-to-be-suspended-indefinitely-skelos-says.html>.

<sup>160</sup> PENAL §§ 265.36–.37; OFFICE OF DIV. COUNSEL, GUIDE TO THE NEW YORK SAFE ACT FOR MEMBERS OF THE DIVISION OF STATE POLICE 7, 9 (2013), *available at* [http://www.nypdcea.org/pdfs/NYSP\\_Safe\\_Act\\_Field\\_Guide.pdf](http://www.nypdcea.org/pdfs/NYSP_Safe_Act_Field_Guide.pdf).

declared to violate the Second Amendment in a federal district court decision.<sup>161</sup> New York City outlaws rifle or shotgun magazines holding more than five rounds.<sup>162</sup>

Also in 2013, Colorado enacted a ban on magazines over fifteen rounds,<sup>163</sup> and Connecticut did the same for magazines over ten.<sup>164</sup> Both statutes allowed current owners to retain possession.<sup>165</sup>

Finally, one state has followed Ohio's former approach of magazine licensing, rather than prohibition. In 1994, Massachusetts began requiring that possession and additional acquisitions of magazines over ten rounds be allowed only for citizens who have a "Class A" firearms license—which most Massachusetts gun owners have.<sup>166</sup>

#### IV. WHAT DOES THE HISTORY MEAN?

Given the history above, what does modern legal doctrine say about the permissibility of outlawing magazines, as in the so-called SAFE Act's ban on possession of magazines of more than ten rounds and loading more than seven rounds in a magazine, or New York City's ban on long gun magazines of more than five rounds? What about bans in other states of more than ten rounds (Maryland, Connecticut, the District of Columbia, California, and Hawaii for handguns only) or more than fifteen rounds (New Jersey and Colorado)?

This Part analyzes these questions in light of Second Amendment

<sup>161</sup> N.Y. State Rifle & Pistol Ass'n v. Cuomo, 990 F. Supp. 2d 349, 372–73 (W.D.N.Y. 2013).

<sup>162</sup> N.Y.C., N.Y., ADMIN. CODE § 10-306(b) (2015).

<sup>163</sup> Act of Mar. 20, 2013, ch. 48, sec. 1, §§ 18-12-301(2)(a)(I), -302(1), 2013 Colo. Sess. Laws 144, 144–45 (codified at COLO. REV. STAT. § 18-12-302(1) (2014)).

<sup>164</sup> Act of April 4, 2013, P.A. 13-3, § 23, 2013 Conn. Acts 47, 66 (Reg. Sess.) (codified at CONN. GEN. STAT. ANN. § 53-202w (West 2015)).

<sup>165</sup> COLO. REV. STAT. § 18-12-302(2) (permitting a person to maintain possession of a banned magazine if he/she owned it prior to the effective date of the law and maintained "continuous possession" thereafter); CONN. GEN. STAT. §§ 53-202w(e)(4), 53-202x(a)(1) (permitting a person to maintain possession of a banned magazine if he/she possessed it prior to the effective date of the law and declared it to the government).

<sup>166</sup> MASS. GEN. LAWS ANN. ch. 140 §§ 121, 131(a) (West 2014) (allowing possession and acquisition of magazines manufactured before Sept. 1994 by anyone with a Class A license); Matt Carroll, *Snapshot: Gun Licenses Per 1,000, 2012*, BOSTON.COM, (Jan. 24, 2013), [http://www.boston.com/yourtown/specials/snapshot/massachusetts\\_snapshot\\_gun\\_licenses\\_2012](http://www.boston.com/yourtown/specials/snapshot/massachusetts_snapshot_gun_licenses_2012) (showing the prevalence of Class A licenses in Massachusetts). A 2014 bill enacted in Massachusetts eliminated the lower category of "Class B" firearms licenses, so presumably all licensed firearms owners in Massachusetts will be able to acquire magazines of more than ten rounds, albeit only magazines manufactured before 1995. Act of Aug. 11, 2014, ch. 284, 2014 Mass. Acts, available at <https://malegislature.gov/Laws/SessionLaws/Acts/2014/Chapter284>.

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precedents from the *Heller* Court and from subsequent cases that have relied at least in part on history and tradition in judging Second Amendment cases.

*A. The Crucial Years: 1789–1791 and 1866–1868*

For original meaning of the Second Amendment, the most important times are when the Second Amendment was created and when the Fourteenth Amendment was created, since a core purpose of the latter amendment was to make the individual's Second Amendment right enforceable against state and local government.<sup>167</sup> Congress sent the Second Amendment to the states for ratification in 1789, and ratification was completed in 1791.<sup>168</sup> The Fourteenth Amendment was passed by Congress in 1866, and ratification by the states was completed in 1868.<sup>169</sup>

1. Magazines in 1789–1791 and 1866–1868

As of 1789 to 1791, multi-shot magazines had existed for two centuries, and a variety of models had come and gone.<sup>170</sup> The state-of-the-art gun between 1789 and 1791 was the twenty- or twenty-two-shot Girandoni air rifle, powerful enough to take down an elk with a single shot.<sup>171</sup>

By the time that the Fourteenth Amendment was introduced in Congress, firearms with magazines of over ten or fifteen rounds had been around for decades.<sup>172</sup> The best of these was the sixteen-shot Henry Rifle, introduced in 1861 with a fifteen-round magazine.<sup>173</sup> The Henry Rifle was commercially successful, but Winchester Model 1866, with its seventeen-round magazine, was massively successful.<sup>174</sup> So by the time ratification of the Fourteenth Amendment was completed in 1868, it was solidly established that firearms with seventeen-round magazines were in common use.

<sup>167</sup> See, e.g., *Ezell v. City of Chi.*, 651 F.3d 684, 702–03 (7th Cir. 2011).

<sup>168</sup> JOHNSON, KOPEL, MOCSARY & O'SHEA, *supra* note 90, at 218.

<sup>169</sup> *Id.* at 299.

<sup>170</sup> See *supra* Part II.B.

<sup>171</sup> See *supra* notes 27–31 and accompanying text.

<sup>172</sup> See *supra* notes 32–35 and accompanying text..

<sup>173</sup> RICHARD C. RATTENBURY, *A LEGACY IN ARMS: AMERICAN FIREARM MANUFACTURE, DESIGN, AND ARTISTRY, 1800–1900*, at 135 (2014); see *supra* note 49 and accompanying text.

<sup>174</sup> CLIFFORD R. CADWELL, *GUNS OF THE LINCOLN COUNTY WAR* 50 (2009); RATTENBURY, *supra* note 173, at 136; *supra* notes 55–55 and accompanying text.

## 2. Magazine Prohibitions in 1789–1791 and 1866–1868

From the colonial period to the dawn of American independence on July 4, 1776, and through the ratification of the Fourteenth Amendment, there were no prohibitions on magazines. Indeed, the first magazine prohibition did not appear until the alcohol prohibition era in 1927.<sup>175</sup> Thus, the historical evidence of the key periods for original meaning strongly suggests that magazine bans are unconstitutional.

*B. “Typically Possessed by Law-Abiding Citizens for Lawful Purposes” or “Dangerous and Unusual”?*

The Supreme Court’s *Heller* decision distinguished two broad types of arms. Some arms, such as handguns, are “typically possessed by law-abiding citizens for lawful purposes.”<sup>176</sup> These arms are also described by the Court as being “in common use.”<sup>177</sup> In contrast, some other arms are “dangerous and unusual.”<sup>178</sup> Examples provided by the Court were short-barreled shotguns or machine guns.<sup>179</sup> The common, typical, arms possessed by law-abiding citizens are protected by the Second Amendment; the “dangerous and unusual” arms are not protected.<sup>180</sup> By definition, “unusual” arms are not “in common use” or “typically possessed by law-abiding citizens for lawful purposes.”<sup>181</sup>

The *Heller* Court did not expressly mandate that historical analysis be used when deciding whether an arm is typical or common or “dangerous and unusual.” The *Heller* Court approvingly quoted the 1939 Supreme Court decision *United States v. Miller*,<sup>182</sup> which had described the original meaning of the Second Amendment as protecting individually-owned firearms that were “in common use at the time.”<sup>183</sup> The *Miller* Court’s 1939 decision did not extend Second Amendment protection to sawed-off

<sup>175</sup> See *supra* notes 129–30 and accompanying text; see also Act of June 2, 1927, No. 372, § 3, 1927 Mich. Public Acts 887, 888–89 (repealed 1959) (regulating the possession of and carrying of certain firearms that were capable of firing sixteen shots without reloading).

<sup>176</sup> See *id.* at 625, 629 (majority opinion).

<sup>177</sup> *Id.* at 627 (quoting *United States v. Miller*, 307 U.S. 174, 179 (1939)).

<sup>178</sup> *Heller*, 554 U.S. at 627.

<sup>179</sup> See *id.* at 625, 627.

<sup>180</sup> See *id.* at 627.

<sup>181</sup> See *id.*

<sup>182</sup> *Id.* (quoting *Miller*, 307 U.S. at 179).

<sup>183</sup> *Heller*, 554 U.S. at 627 (quoting *Miller*, 307 U.S. at 179) (internal quotation marks omitted).

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shotguns;<sup>184</sup> as *Heller* explained *Miller*, the *Miller* principle was that sawed-off shotguns are dangerous and unusual.<sup>185</sup>

To be precise, *Miller* did not formally rule that short shotguns are *not* Second Amendment arms; the Court simply reversed and remanded the district court's decision granting criminal defendant Miller's motion to quash his indictment.<sup>186</sup> The Supreme Court said that the suitability of sawed-off shotguns as Second Amendment arms was not a fact that was subject to "judicial notice."<sup>187</sup> Presumably the federal district court in Arkansas could have taken up the remanded case and then received evidence regarding what sawed-off shotguns are used for and how common they are. But Miller and his co-defendant Frank Layton had disappeared long before the case was decided by the Supreme Court.<sup>188</sup>

Regardless, subsequent courts, including the court in *Heller*, read *Miller* as affirmatively stating that sawed-off shotguns are not protected by the Second Amendment.<sup>189</sup>

Even though *Heller*'s "common" or "typical" versus "dangerous and unusual" dichotomy seems primarily concerned with contemporary uses of a given type of arm, history can still be useful. As detailed in Part II, magazines of more than ten rounds have been very commonly possessed in the United States since 1862.<sup>190</sup> Common sense tells us that the small percentage of the population who are violent gun criminals is not remotely large enough to explain the massive market for magazines of more than ten rounds that has existed since the mid-nineteenth century. We have more than a century and a half of history showing such magazines to be owned by many millions of law-abiding Americans.<sup>191</sup>

Thus, a court which today ruled that such magazines are "dangerous and unusual" would seem to have some burden of explaining how such magazines, after a century and a half of being

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<sup>184</sup> *Miller*, 307 U.S. at 178.

<sup>185</sup> *Heller*, 554 U.S. at 625.

<sup>186</sup> *Miller*, 307 U.S. at 177, 183.

<sup>187</sup> *Id.* at 178. "Judicial notice" is when courts rely on facts that are not in the record of the case, but which are indisputably true. FED. R. EVID. 201. For example, they may be a subject of common knowledge (e.g., that in Arkansas, the sun is never visible in the sky at midnight) or can be ascertained from indisputable sources (e.g., that a particular section of the Code of Federal Regulations contains certain language). *See id.*

<sup>188</sup> Brian L. Frye, *The Peculiar Story of United States v. Miller*, 3 N.Y.U. J.L. & LIBERTY 48, 65–68 (2008). *The Peculiar Story of United States v. Miller* was cited by the Court in *Heller*. *Heller*, 554 U.S. at 623.

<sup>189</sup> *Heller*, 554 U.S. at 621–22.

<sup>190</sup> *See supra* Part II.

<sup>191</sup> *See supra* Part II.



“in common use” and “typically possessed by law-abiding citizens for lawful purposes,” became “dangerous and unusual” in the twenty-first century.

This is not possible. Today, magazines of more than ten rounds are more common than ever before.<sup>192</sup> They comprise about forty-seven percent of magazines currently possessed by Americans today.<sup>193</sup> The AR-15 rifle (introduced in 1963) is the most popular rifle in American history, with sales of several million;<sup>194</sup> its standard magazines are twenty or thirty rounds.<sup>195</sup>

*C. “Longstanding” Controls Versus “Few Laws in the History of Our Nation”*

Just as *Heller* distinguishes types of arms (common or typical versus dangerous and unusual), *Heller* distinguishes types of arms-control laws. One type of arms controls are “longstanding,” and these are “presumptively lawful.”<sup>196</sup> Examples listed by *Heller* are bans on gun possession “by felons and the mentally ill,” bans on carrying guns “in sensitive places such as schools and government buildings,” and “conditions and qualifications on the commercial sale of arms.”<sup>197</sup>

The *Heller* Court highlighted the unusual nature of the District of Columbia anti-gun laws:

Few laws in the history of our Nation have come close to the severe restriction of the District’s handgun ban. And some of those few have been struck down. In *Nunn v. State*, the Georgia Supreme Court struck down a prohibition on carrying pistols openly (even though it upheld a prohibition on carrying concealed weapons). In *Andrews v. State*, the Tennessee Supreme Court likewise held that a statute that forbade openly carrying a pistol “publicly or privately, without regard to time or place, or circumstances,” violated

<sup>192</sup> See *Fyock v. City of Sunnyvale*, No. C-13-5807-RMW, 2014 U.S. Dist. LEXIS 29722, at \*13 (N.D. Cal. Mar. 5, 2014) (agreeing with and incorporating affidavit from plaintiffs’ expert that “whatever the actual number of such magazines in United States consumers’ hands is, it is in the tens-of-millions, even under the most conservative estimates.”).

<sup>193</sup> *Id.* (“Plaintiffs cite statistics showing that magazines having a capacity to accept more than ten rounds make up approximately 47 percent of all magazines owned.”).

<sup>194</sup> PATRICK SWEENEY, *THE GUN DIGEST BOOK OF THE AR-15*, at 14 (2005); see Meghan Lisson, *Run on Guns: AR-15s Sales Soar*, CNBC (Apr. 25, 2013), <http://www.cnbc.com/id/100673826>.

<sup>195</sup> SWEENEY, *supra* note 194, at 99.

<sup>196</sup> *District of Columbia v. Heller*, 554 U.S. 570, 626, 627 n.26 (2008).

<sup>197</sup> *Id.* at 626–27.

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the state constitutional provision (which the court equated with the Second Amendment). That was so even though the statute did not restrict the carrying of long guns.<sup>198</sup>

What was the history that led the Court to declare the handgun prohibition to be “unusual”—that is, to be the opposite of a traditional gun control that was presumptively constitutional? The District of Columbia handgun ban was enacted in 1975 and took effect in 1976.<sup>199</sup> Chicago enacted a similar ban in 1982, and a half-dozen Chicago suburbs followed suit during the 1980s.<sup>200</sup> In 1837, the Georgia legislature had enacted a handgun ban, but that was ruled unconstitutional on Second Amendment grounds by the unanimous Georgia Supreme Court in 1846.<sup>201</sup> In 1982 and 2005, San Francisco enacted handgun bans, but they were both ruled unlawful because of their plain violation of the California state preemption statute, which forbids localities to outlaw firearms which are permitted under state law.<sup>202</sup>

These are the facts under which the Supreme Court declared handgun bans to be suspiciously rare in America’s history—at the other end of the spectrum from the presumptively constitutional “longstanding” controls.

The 1975 District of Columbia handgun ban was thirty-three years old when the Supreme Court decided *Heller* in 2008. This suggests that thirty-three years is not sufficient for a gun control to be considered “longstanding.”

As detailed in Part III, the first of today’s magazine bans was enacted by New Jersey in 1990, at fifteen rounds.<sup>203</sup> The first state-level ten-round ban did not take effect until California passed such

<sup>198</sup> *Id.* at 629 (citations omitted) (citing *Nunn v. State*, 1 Ga. 243, 251 (1846); *Andrews v. State*, 50 Tenn. 165, 187 (1871)); *see also Heller*, 554 U.S. at 629 (“A statute which, under the pretence of regulating, amounts to a destruction of the right, or which requires arms to be so borne as to render them wholly useless for the purpose of defence, would be clearly unconstitutional . . .” (quoting *State v. Reid*, 1 Ala. 612, 616–17 (1840)) (internal quotation marks omitted)).

<sup>199</sup> Edward D. Jones, III, *The District of Columbia’s “Firearms Control Regulations Act of 1975”: The Toughest Handgun Control Law in the United States—Or Is It?*, 455 ANNALS AM. ACAD. POL. & SOC. SCI. 138, 139 (1981).

<sup>200</sup> *See McDonald v. City of Chi.*, 561 U.S. 742, 749 (2010); Steve Chapman, *Chicago’s Pointless Handgun Ban: City Gun Ordinances Proved to Be a Failure*, CHI. TRIB., Mar. 4, 2010, at C21.

<sup>201</sup> *Nunn*, 1 Ga. at 246, 251. The *Heller* Court cited this case with approval. *Heller*, 554 U.S. at 612.

<sup>202</sup> *Fiscal v. City & Cnty. of S.F.*, 70 Cal. Rptr. 3d 324, 326, 341–42 (Ct. App. 2008); *Doe v. City & Cnty. of S.F.*, 186 Cal Rptr. 380, 381 (Ct. App. 1982).

<sup>203</sup> *See supra* note 151–52 and accompanying text.



a law in 2000.<sup>204</sup> These statutes, and other post-1990 magazine bans, would not qualify as “longstanding.”

Previously, three states and the District of Columbia had enacted some magazine restrictions during the alcohol prohibition era.<sup>205</sup> The District of Columbia ban, with modifications, is still in effect.<sup>206</sup> The Michigan and Rhode Island bans were repealed long ago.<sup>207</sup> The Ohio special licensing statute allowed the free purchase of any magazine, but required a permit to insert a magazine of thirty-two rounds or more into a firearm; the permit requirement was repealed in 2014.<sup>208</sup> It is indisputable in the modern United States that magazines of up to thirty rounds for rifles and up to twenty rounds for handguns are standard equipment for many popular firearms.

Several post-*Heller* lower courts have conducted in-depth examinations of the history of particular gun control laws. The next Part examines each of those cases and then applies their methodology to the historical facts of bans on magazines of more than five, seven, ten, and fifteen rounds.

#### *D. Lower-Court Decisions Applying History*

##### *1. Ezell v. City of Chicago*

After *McDonald v. City of Chicago* made it clear that the Second Amendment applies to municipal governments, the Chicago City Council relegalized handgun possession and outlawed all target ranges within city limits.<sup>209</sup> Assessing the constitutionality of the ban, the Seventh Circuit used a two-step test, similar to analysis that is sometimes used in First Amendment cases: (1) Is the activity or item within the scope of the Second Amendment, as historically understood? If the answer is “no,” then the restrictive law does not violate the Second Amendment.<sup>210</sup> (2) If the answer to the first question is “yes,” then the court will apply some form of the heightened scrutiny. The intensity of the scrutiny will depend on how close the restriction comes to affecting the core right of armed self-defense.<sup>211</sup>

<sup>204</sup> See *supra* note 156 and accompanying text.

<sup>205</sup> See *supra* notes 129–30, 134, 140 and accompanying text.

<sup>206</sup> See *supra* notes 140–45 and accompanying text.

<sup>207</sup> See *supra* notes 131, 133 and accompanying text.

<sup>208</sup> See *supra* notes 135–39 and accompanying text.

<sup>209</sup> *Ezell v. City of Chi.*, 651 F.3d 684, 690–91 (7th Cir. 2011).

<sup>210</sup> *Id.* at 702–03.

<sup>211</sup> *Id.* at 703.

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So the *Ezell* court began the step-one analysis by considering whether target practice was historically considered part of the Second Amendment right.<sup>212</sup> Chicago had argued to the contrary, listing some eighteenth- and nineteenth-century state statutes and municipal ordinances restricting firearms discharge within city limits.<sup>213</sup> The Seventh Circuit found almost all of the listed ordinances to be irrelevant.<sup>214</sup> Many of them did not ban firearms discharge but simply required a permit.<sup>215</sup> Others were plainly concerned with fire prevention, an issue that would not be a problem at a properly-designed modern range.<sup>216</sup> Thus:

Only two—a Baltimore statute from 1826 and an Ohio statute from 1831—flatly prohibited the discharge of firearms based on concerns unrelated to fire suppression, in contrast to the other regulatory laws we have mentioned. This falls far short of establishing that target practice is wholly outside the Second Amendment as it was understood when incorporated as a limitation on the States.<sup>217</sup>

So according to the Seventh Circuit, the historical example of repressive laws in one state and one city are insufficient to support the inference that the repressed activity is outside the scope of the Second Amendment.<sup>218</sup> The historical basis of restrictions that would affect magazines over fifteen rounds is nearly as thin: two states with statutes enacted in 1927, and later repealed, plus the District of Columbia's 1932 law.<sup>219</sup> As for imposing a ban for guns with magazines of more than ten rounds (or seven or five), there is *no* historical basis.

Thus, under the *Ezell* analysis, bans on magazines infringe the Second Amendment right as it was historically understood, and such bans must be analyzed under heightened scrutiny.

## 2. *United States v. Rene E.*

In 2009, the First Circuit heard a Second Amendment challenge

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<sup>212</sup> *Id.* at 704.

<sup>213</sup> *Id.* at 705–06.

<sup>214</sup> *Id.*

<sup>215</sup> *Id.* at 705.

<sup>216</sup> *Id.* at 706.

<sup>217</sup> *Id.* (quoting *District of Columbia v. Heller*, 554 U.S. 570, 632 (2008)); *see also Heller*, 554 U.S. at 632 (“[W]e would not stake our interpretation of the Second Amendment upon a single law . . . that contradicts the overwhelming weight of other evidence . . .”).

<sup>218</sup> *See Ezell*, 652 F.3d at 706.

<sup>219</sup> *See supra* notes 131, 133, 140 and accompanying text.

to a federal statute that restricted, but did not ban, handgun possession by juveniles.<sup>220</sup> The federal statute was enacted in 1994,<sup>221</sup> and so of course was not “longstanding.”<sup>222</sup> The First Circuit looked at the history of state laws restricting juvenile handgun possession, to see if they were longstanding.<sup>223</sup>

The First Circuit found state or local restrictions on handgun transfers to juveniles and judicial decisions upholding such restrictions from Georgia (1911 case), Tennessee (1878 case),<sup>224</sup> Pennsylvania (1881 case),<sup>225</sup> Indiana (1884 case),<sup>226</sup> Kentucky (1888 case),<sup>227</sup> Alabama (1858 case),<sup>228</sup> Illinois (1917 case upholding a Chicago ordinance),<sup>229</sup> Kansas (1883 case allowing tort liability for transfer), and Minnesota (1918 case allowing tort liability for transfer).<sup>230</sup>

Thus, the First Circuit was able to point to six state statutes, all of them enacted well over a century previously.<sup>231</sup> They were buttressed by one municipal ordinance and two cases allowing tort liability, both of these being nearly a century old.<sup>232</sup>

The history of magazine restrictions is considerably weaker than that of the juvenile handgun statutes analyzed in *Rene E.* There were six statutes on juveniles, all of which were enacted before 1890, and one of which predated the Civil War.<sup>233</sup> This is much more than the pair of state statutes on magazines dating from the late 1920s.

The *Rene E.* case does not attempt to quantify how many state statutes are necessary for a gun control to be longstanding; however, we can say that magazine restrictions fall well short of the historical foundation that the First Circuit relied on to uphold juvenile handgun restrictions.

While *Rene E.* and *Ezell* both used history, the particular way that they used it was different. For *Rene E.*, history was mixed in

<sup>220</sup> 18 U.S.C. § 922(x)(2)–(3) (2013); *United States v. Rene E.*, 583 F.3d 8, 16 (1st Cir. 2009).

<sup>221</sup> *Rene E.*, 583 F.3d at 12.

<sup>222</sup> *Id.*

<sup>223</sup> *Id.* at 14–15.

<sup>224</sup> *State v. Callicutt*, 69 Tenn. 714, 716–17 (1878).

<sup>225</sup> *McMillan v. Steele*, 119 A. 721, 722 (Pa. 1923).

<sup>226</sup> *State v. Allen*, 94 Ind. 441, 441 (1884).

<sup>227</sup> *Tankersly v. Commonwealth*, 9 S.W. 702, 703 (Ky. 1888).

<sup>228</sup> *Coleman v. State*, 32 Ala. 581, 582–83 (1858).

<sup>229</sup> *Biffer v. Chicago*, 116 N.E. 182, 184 (Ill. 1917).

<sup>230</sup> *Schmidt v. Capital Candy Co.*, 166 N.W. 502, 503–04 (Minn. 1918).

<sup>231</sup> *United States v. Rene E.*, 583 F.3d 8, 14–15 (1st Cir. 2009).

<sup>232</sup> *Id.*

<sup>233</sup> *Id.*

with substantive analysis of the modern federal statute, which the First Circuit praised for its “narrow scope” and “important exceptions.”<sup>234</sup>

For *Ezell*, history was just the first step. *Ezell* used history to determine that the range ban was not presumptively lawful; once that question was answered, *Ezell* proceeded to analyze the ban under heightened scrutiny.<sup>235</sup>

### 3. *Heller II*

#### a. *Majority Opinion*

In the 2008 case *District of Columbia v. Heller*, the Supreme Court ruled that two District of Columbia ordinances violated the Second Amendment: the handgun ban and the ban on the requirement that any firearm in the home be kept locked or disassembled and thus unusable for self-defense.<sup>236</sup> Further, the District of Columbia required a permit to carry a gun anywhere (even from room to room in one’s home)<sup>237</sup> and permits were never granted; the Court ordered that plaintiff Dick Heller be granted a permit.<sup>238</sup>

The Council of the District of Columbia responded by repealing all three of the unconstitutional ordinances and enacting the most severe gun control system in the United States.<sup>239</sup> Dick Heller and several other plaintiffs challenged the new ordinances in the case known as *Heller II*.<sup>240</sup>

Using the two-step test, the District of Columbia Circuit majority first examined whether any of the challenged provisions were “longstanding.”<sup>241</sup> If so, then the provision would be held as not violating the Second Amendment right, with no further analysis needed.<sup>242</sup>

Regarding handgun registration, the majority identified statutes from New York (1911), Illinois (1881), Georgia (1910), Oregon

<sup>234</sup> *Id.* at 11–16 (“[T]his law, with its narrow scope and its exceptions, does not offend the Second Amendment.”). Exceptions include farm and ranch work as well as target shooting or other activities under parental supervision. 18 U.S.C. § 922(x)(3)(A)(i)–(ii) (2013).

<sup>235</sup> *Ezell v. City of Chi.*, 651 F.3d 684, 706 (7th Cir. 2011).

<sup>236</sup> *District of Columbia v. Heller*, 554 U.S. 570, 635 (2008).

<sup>237</sup> *Id.* at 574–75.

<sup>238</sup> *Id.* at 635.

<sup>239</sup> *See Heller v. District of Columbia (Heller II)*, 670 F.3d 1244, 1248–49 (D.C. Cir. 2011).

<sup>240</sup> *Id.* at 1247.

<sup>241</sup> *Id.* at 1252–53.

<sup>242</sup> *See id.* at 1252.

(1917), and Michigan (1927).<sup>243</sup> In addition, some jurisdictions required handgun buyers to provide information about themselves to retailers, but did not require that the retailer deliver the information to the government: California (1917), Territory of Hawaii (1927), and the District of Columbia (1932).<sup>244</sup> So “[i]n sum, the basic requirement to register a handgun is longstanding in American law, accepted for a century in diverse states and cities and now applicable to more than one fourth of the nation by population.”<sup>245</sup>

The requirement that the government be provided with some basic information about persons acquiring handguns, in a manner that was “self-evidently *de minimis*” was therefore constitutional.<sup>246</sup> Seven states, with laws originating between 1881 and 1927, were apparently sufficiently numerous and “diverse” to qualify as “longstanding.”

However, although *de minimis* registration of handguns was longstanding, many of the new District of Columbia requirements went beyond traditional *de minimis* systems.<sup>247</sup> Further, “[t]hese early registration requirements, however, applied with only a few exceptions solely to handguns—that is, pistols and revolvers—and not to long guns. Consequently, we hold the basic registration requirements are constitutional only as applied to handguns. With respect to long guns they are novel, not historic.”<sup>248</sup> So the case was remanded to the district court for further fact-finding, since the District of Columbia government had provided the court with almost no information about whether the novel requirements passed heightened scrutiny by being narrowly tailored.<sup>249</sup>

The case had come to the District of Columbia Circuit following cross motions for summary judgment.<sup>250</sup> While the circuit court decided that the novel registration requirements needed a more complete factual record, the panel also decided that the record contained enough information for a ruling on the merits of the District’s ban on various semiautomatic rifles, which the district council labeled “assault weapons,” and on the District’s ban on

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<sup>243</sup> *Id.* at 1253–54.

<sup>244</sup> *See id.* at 1254.

<sup>245</sup> *Id.* The court listed seven states that today have handgun registration laws. *Id.* at n.\*.

<sup>246</sup> *Id.* at 1254–55.

<sup>247</sup> *Id.* at 1255.

<sup>248</sup> *Id.*

<sup>249</sup> *See id.* at 1247.

<sup>250</sup> *See id.*

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magazines holding more than ten rounds.<sup>251</sup>

The District of Columbia Circuit majority stated “[w]e are not aware of evidence that prohibitions on either semi-automatic rifles or large-capacity magazines are longstanding and thereby deserving of a presumption of validity.”<sup>252</sup> In a footnote, the majority cited the 1927 Michigan magazine statute and the 1932 District of Columbia ordinance detailed in Part III of this article.<sup>253</sup> There is no reason to think that the majority’s determination on this point would change if the 1927 Rhode Island statute had also been cited.

Importantly, the majority did not suggest that the magazine bans enacted in 1990 or thereafter had any relevance to whether magazine bans are “longstanding.”

Accordingly, the majority proceeded to analyze the rifle and magazine bans. The majority provided two paragraphs of explanation of why the rifle ban passed intermediate scrutiny and one paragraph on why the magazine ban did so.<sup>254</sup>

Discussion of whether intermediate scrutiny was the correct standard, or whether magazine bans pass intermediate scrutiny, is beyond the scope of this article. However, it does seem to appear that the District of Columbia Circuit would have acted more prudently by remanding the case for fact-finding in the district court. To support the ban, the panel majority could only point to legislative testimony by a gun-prohibition lobbyist and by the District of Columbia police chief, plus a Department of Justice report on the 1994 to 2004 federal ban on such magazines.<sup>255</sup> Notably, the panel majority did not address the report’s finding that a ten-year nationwide ban had led to no discernible reduction in homicides, injuries, or the number of shots fired in crimes.<sup>256</sup>

#### *b. Dissent*

A forceful dissent by Judge Brett Kavanaugh critiqued the majority’s application of intermediate scrutiny.<sup>257</sup> He argued that

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<sup>251</sup> *Id.* at 1246, 1260, 1264.

<sup>252</sup> *Id.* at 1260.

<sup>253</sup> *Id.* at 1260 n.\*.

<sup>254</sup> *Id.* at 1262–64.

<sup>255</sup> *Id.* at 1263–64.

<sup>256</sup> KOPER EL AL., *supra* note 148, at 92.

<sup>257</sup> *Heller II*, 670 F.3d at 1285 (Kavanaugh, J., dissenting) (“A ban on a class of arms is not an ‘incidental’ regulation. It is equivalent to a ban on a category of speech. Such restrictions on core enumerated constitutional protections are *not* subjected to mere intermediate scrutiny review. The majority opinion here is in uncharted territory in suggesting that intermediate scrutiny can apply to an outright ban on possession of a class of weapons that have not

the majority's approach was necessarily incorrect, because its logic on banning semiautomatic rifles would allow a ban on all semiautomatic handguns—which constitute the vast majority of handguns produced today.<sup>258</sup>

More fundamentally, he argued that *Heller* does not tell courts to use tiered scrutiny to assess gun control laws.<sup>259</sup> Rather, *Heller* looks to history and tradition.<sup>260</sup> So gun controls that are well-grounded in history and tradition are constitutional; gun control laws which are not so grounded are unconstitutional.<sup>261</sup>

Using the standard of history and tradition, Judge Kavanaugh argued that the entire District of Columbia registration scheme was unconstitutional.<sup>262</sup> Regarding de minimis handgun registration, the statutes cited by the majority were mostly record-keeping requirements for gun dealers, not centralized information collection by the government.<sup>263</sup> The novel and much more onerous requirements of the District of Columbia registration system for all guns had no basis in history and tradition.<sup>264</sup> For all firearms, any registration system beyond dealer record-keeping requirements was unconstitutional.<sup>265</sup>

Judge Kavanaugh examined the history of semiautomatic rifles and found them to be in common use for over a century and thus protected by the Second Amendment from prohibition.<sup>266</sup> He did not have similar information on magazines and thus urged that the magazine issue be remanded for fact-finding.<sup>267</sup> In light of the evidence on magazines that has been presented subsequent to the 2011 *Heller II* decision, Judge Kavanaugh's methodology

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traditionally been banned.”).

<sup>258</sup> *Id.* at 1285–86.

<sup>259</sup> *See id.* at 1282.

<sup>260</sup> *Id.* (“*Heller* was resolved in favor of categoricalism—with the categories defined by text, history, and tradition—and against balancing tests such as strict or intermediate scrutiny or reasonableness.”).

<sup>261</sup> *See id.*

<sup>262</sup> *Id.* at 1286.

<sup>263</sup> *See id.* at 1292–93.

<sup>264</sup> *Id.* at 1294.

<sup>265</sup> *See id.*

<sup>266</sup> *See id.* at 1287 (citing JOHNSON, KOPEL, MOCSARY & O'SHEA, *supra* note 90, at 11).

<sup>267</sup> *Heller II*, 670 F.3d at 1296 n.20 (Kavanaugh, J., dissenting) (“The D.C. ban on magazines of more than 10 rounds requires analysis in the first instance by the District Court. In order to apply *Heller*'s test to this prohibition, we must know whether magazines with more than 10 rounds have traditionally been banned and are not in common use. The parties here did not brief that question in much detail. Evidence presented to the District Court on the history and prevalence of magazines of more than 10 rounds would be helpful to the proper disposition of that issue under the *Heller* test. Therefore, I would remand to the District Court for analysis of that issue.”).



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straightforwardly leads to the conclusion that the District of Columbia magazine ban is unconstitutional.<sup>268</sup> The *Heller II* majority rightly recognized that magazine bans are not “longstanding,”<sup>269</sup> and this article has demonstrated that magazines of more than ten rounds have been a common part of the American tradition of firearms ownership since before the ratification of the Fourteenth Amendment in 1868.

#### 4. *Silvester v. Harris*

Another decision carefully employing historical analysis is *Silvester v. Harris*,<sup>270</sup> from the United States District Court for the Eastern District of California.

A California statute requires that firearms purchasers wait ten days before they can take their gun home from the store.<sup>271</sup> In California, background checks on firearms buyers are sometimes completed within minutes and sometimes can take a week or longer.<sup>272</sup> Senior District Judge Anthony Ishii (appointed to the federal court in 1997 by President Clinton)<sup>273</sup> ruled the waiting period unconstitutional, to the extent that the waiting period lasted longer than the time required to complete the background check on a given buyer.<sup>274</sup>

Like the Seventh Circuit in *Ezell*, Judge Ishii looked to 1791 and 1868 as the crucial periods.<sup>275</sup>

California Attorney General Kamala Harris had directed the court to a book arguing that between 1790 and 1840 many Americans might have to travel for several days in order to buy a gun, so there was a de facto waiting period between the time a person decided to buy a gun and when a person could take possession of the gun.<sup>276</sup> Judge Ishii held this irrelevant; the court’s job was to consider the legality of government regulations that

<sup>268</sup> See Lindsay Colvin, Note, *History, Heller, and High-Capacity Magazines: What Is the Proper Standard of Review for Second Amendment Challenges?*, 41 FORDHAM URB. L.J. 1041, 1075–80 (2014).

<sup>269</sup> *Heller II*, 670 F.3d at 1260.

<sup>270</sup> *Silvester v. Harris*, No. 1:11–CV–2137 AWI SAB, 2014 U.S. Dist. LEXIS 118284 (E.D. Cal. Aug. 25, 2014).

<sup>271</sup> CAL. PENAL CODE §§ 26815(a), 27540(a) (West 2014).

<sup>272</sup> *Silvester*, 2014 U.S. Dist. LEXIS 118284, at \*82.

<sup>273</sup> Chief District Court Judge Anthony W. Ishii, U.S. DIST. COURT: E. DIST. OF CAL., [http://www.caed.uscourts.gov/caed/staticOther/page\\_630.htm](http://www.caed.uscourts.gov/caed/staticOther/page_630.htm) (last visited Feb. 21, 2015).

<sup>274</sup> *Silvester*, 2014 U.S. Dist. LEXIS 118284, at \*101–02.

<sup>275</sup> Compare *id.* at \*30, with *Ezell v. City of Chi.*, 651 F.3d 684, 702–03 (7th Cir. 2011).

<sup>276</sup> *Silvester*, 2014 U.S. Dist. LEXIS 118284, at \*8–9.

might impede the exercise of a constitutional right and the book provided no evidence that government-imposed waiting periods for firearm purchases existed between 1790 and 1840.<sup>277</sup>

Another book explained that the first waiting period law was proposed in 1923—a one-day waiting period for handguns.<sup>278</sup> The law was adopted in California and eventually by eight other states.<sup>279</sup> This too was irrelevant, ruled the court, because it had nothing to do with 1791 or 1868.<sup>280</sup>

The court explained that “[i]t is Defendant’s burden to show that the 10–day waiting period either falls outside the scope of Second Amendment protections as historically understood or fits within one of several categories of longstanding regulations that are presumptively lawful.”<sup>281</sup>

The complete absence of evidence of waiting periods in 1791 and 1868 eliminated the first possibility.<sup>282</sup> What about the question of whether waiting periods were “longstanding regulations that are presumptively lawful”? The answer to this question is not confined to 1791 and 1868.

The court explained that “the concept of a ‘longstanding and presumptively lawful regulation’ is that the regulation has long been accepted and is rooted in history.”<sup>283</sup> California’s 1923 statute did not come close. Besides that, the California wait was only one day and only for retail handguns.<sup>284</sup> Not until 1975 was the number of days extended to double digits and not until 1991 to long guns.<sup>285</sup> Consistent with the unusual nature of waiting periods, only ten states and the District of Columbia today have a waiting period for at least some firearms.<sup>286</sup>

Thus, the court concluded that the plaintiffs’ challenge had passed step one of the two-step test,<sup>287</sup> and the court proceeded to apply heightened scrutiny.<sup>288</sup> The court stated that it did not have to decide whether to use strict or intermediate scrutiny.<sup>289</sup> The

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<sup>277</sup> *See id.* at \*9–10, \*78.

<sup>278</sup> *Id.* at \*11.

<sup>279</sup> *Id.*

<sup>280</sup> *Id.* at \*11–12.

<sup>281</sup> *Id.* at \*75.

<sup>282</sup> *Id.* at \*75–76.

<sup>283</sup> *Id.* at \*78 (citations omitted).

<sup>284</sup> *Id.* at \*79.

<sup>285</sup> *Id.*

<sup>286</sup> *Id.* at \*30.

<sup>287</sup> *Id.* at \*75–76.

<sup>288</sup> *Id.* at \*80.

<sup>289</sup> *Id.*

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waiting period statute failed intermediate scrutiny, as applied to persons who already possessed a firearm (based on state registration data), and who passed the background check when purchasing an additional firearm.<sup>290</sup> Therefore, *a fortiori*, the statute would fail strict scrutiny. The court gave the state legislature 180 days to revise the statute so as to eliminate the post-background-check waiting period for persons who already have a gun.<sup>291</sup> The plaintiffs had not challenged the waiting period as applied to first-time gun buyers, nor as to persons who had not yet passed the background check.<sup>292</sup>

## V. CONCLUSION

Rifle magazines holding more than ten or fifteen rounds have been common in the United States since the mid-nineteenth century.<sup>293</sup> Handgun magazines over ten rounds have been common since 1935, and handgun magazines over fifteen have been common since the mid-1960s.<sup>294</sup>

Magazine prohibition has historically been rare. There is *no* historical basis for a magazine limit of ten rounds or lower. As for prohibitions with higher limits, there are only two examples, both of them from 1927, the outer edge of what courts have considered to be examples of state statutes that may be considered “longstanding”: Michigan (enacted 1927, repealed 1959), Rhode Island (enacted 1927, loosened 1959, repealed 1975).<sup>295</sup> Ohio formerly required a special permit to actually insert a magazine above a certain size into a firearm but never banned sales.<sup>296</sup> (The original limit was eighteen rounds or more and later was thirty-two rounds or more.)<sup>297</sup> As is often the case, the District of Columbia is the *sui generis* outlier, with its 1932 restriction still in effect today, with some modifications.<sup>298</sup>

Of all the courts that have examined history when ruling on gun control issues, no court has ever held that laws of two or three states plus one city are sufficient to establish a gun law as being

<sup>290</sup> *Id.* at \*90–91, 96–97.

<sup>291</sup> *Id.* at \*101–03.

<sup>292</sup> *See id.* at \*23–25.

<sup>293</sup> *See supra* notes 43–64 and accompanying text.

<sup>294</sup> *See supra* notes 102–06 and accompanying text.

<sup>295</sup> *See supra* notes 130, 132–33 and accompanying text.

<sup>296</sup> *See supra* notes 136–39 and accompanying text.

<sup>297</sup> *See supra* notes 134–35 and accompanying text.

<sup>298</sup> *See supra* notes 140–45 and accompanying text.

“longstanding” or part of American history and tradition. To the contrary, ammunition capacity limits are far outside the norm of the traditional exercise and regulation of Second Amendment rights. Not until California in 1999 did any state set a magazine limit as low as ten.<sup>299</sup>

What does this mean for modern legal analysis? Under judicial methods which hew closely to history and tradition, the historical absence (of limits of ten or less) or the extreme rarity (limits of fifteen or less) would be sufficient for any such modern limit to be ruled unconstitutional. Owning such magazines is very long-established manner in which the right to arms has historically been exercised in America.

Other courts perform a two-step test. Challengers to magazine limit laws should always pass step one, since magazine limits are not “longstanding.”

As for step two—review under some form of heightened scrutiny—the Supreme Court taught in *Heller* that when the “severe restriction” of a “ban” has support from “[f]ew laws in the history of our Nation,” the law’s constitutionality is very doubtful. This was true for the prohibition of handguns, and it is also true for the prohibition of magazines holding more than five, seven, ten, or fifteen rounds.

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<sup>299</sup> See *supra* note 156 and accompanying text.

# EXHIBIT 20

# Firearms technology and the original meaning of the Second Amendment

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[washingtonpost.com/news/volokh-conspiracy/wp/2017/04/03/firearms-technology-and-the-original-meaning-of-the-second-amendment](https://www.washingtonpost.com/news/volokh-conspiracy/wp/2017/04/03/firearms-technology-and-the-original-meaning-of-the-second-amendment)

David Kopel

April 4, 2017

## The Volokh Conspiracy

Analysis by [David Kopel](#)

Contributor, The Volokh Conspiracy

April 3, 2017 at 9:34 p.m. EDT

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Gun-control advocates often argue that gun-control laws must be more restrictive than the original meaning of the Second Amendment would allow, because modern firearms are so different from the firearms of the late 18th century. This argument is based on ignorance of the history of firearms. It is true that in 1791 the most common firearms were handguns or long guns that had to be reloaded after every shot. But it is not true that repeating arms, which can fire multiple times without reloading, were unimaginable in 1791. To the contrary, repeating arms long predate the 1606 founding of the first English colony in America. As of 1791, repeating arms were available but expensive.

This article explains why the price of repeating arms declined so steeply. Then it describes some of the repeating arms that were already in use when the Second Amendment was ratified, including the 22-shot rifle that was later carried on the Lewis and Clark expedition.

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One of the men to credit for why repeating arms became much less expensive during the 19th century is James Madison, author of the Second Amendment. During Madison's presidency (1809-17), Secretary of War James Monroe (who would succeed Madison as president), successfully promoted legislation to foster the development of firearms technology. In particular, the federal armories at Springfield, Mass., and Harpers Ferry, Va., were ordered to invent the means of producing firearms with interchangeable parts.

To function reliably, repeating firearms must have internal components that fit together very precisely — much more precisely than is necessary for single-shot firearms. Before President Madison and Secretary Monroe started the manufacturing revolution, firearms

were built one at a time by craftsmen. Making a repeating arm required much more time and expertise than making a single-shot firearm. *How* to make repeating arms was well-known, but making them at a labor cost the average person could afford was impossible.

Thanks to the technology innovation labs created at Springfield and Harpers Ferry, inventors found ways to manufacture firearms components at a higher rate, and with more consistency for each part. Instead of every part being made by hand, parts were manufactured with machine tools (tools that make other tools). For example, the wooden stocks for rifles could be repetitively manufactured with such precision that any stock from a factory would fit any rifle from the factory, with no need for craftsmen to shave or adjust the stock.

In New England, the Springfield Armory worked with emerging machinists for other consumer products; the exchange of information in this technology network led directly to the Connecticut River Valley becoming a center of American consumer firearms manufacture, and to rapid improvements in the manufacture of many other consumer durables. The story is told in: Ross Thomson, *Structures of Change in the Mechanical Age: Technological Innovation in the United States 1790-1865* (2009); Alexander Rose, *American Rifle: A Biography* (2008); David R. Meyer, *Networked Machinists: High-Technology Industries in Antebellum America* (2006); David A. Hounshell, *From the American System to Mass Production, 1800-1932* (1985); Merritt Roe Smith, *Harpers Ferry Armory and the New Technology: The Challenge of Change* (1977); Felicia Johnson Deyrup, *Arms Makers of the Connecticut Valley: A Regional Study of the Economic Development of the Small Arms Industry, 1798-1870* (1948). By the 1830s, manufacturing uniformity was sufficiently advanced that repeating arms were becoming widely affordable, and no longer just for the wealthy.

What kind of repeating arms were available before 1815, when the Madison-Monroe mass production innovation program began? The state of the art was the Girandoni air rifle, invented around 1779 for Austrian army sharpshooters. Lewis and Clark would carry a Girandoni on their famous expedition, during the Jefferson administration. The Girandoni could shoot 21 or 22 bullets in .46 or .49 caliber without reloading. Ballistically equal to a firearm, a single shot from the Girandoni could penetrate a one-inch wood plank, or take an elk. (For more on the Girandoni, see my article "The History of Firearms Magazines and Magazine Prohibitions," 88 Albany L. Rev. 849, 852-53 (2015).)

The first repeaters had been invented about three centuries before. The earliest-known model is a German breech-loading matchlock arquebus from around 1490-1530 with a 10-shot revolving cylinder. M.L. Brown, *Firearms in Colonial America: The Impact on History and Technology, 1492-1792*, 50 (1980). Henry VIII had a long gun that used a revolving cylinder (a "revolver") for multiple shots. W.W. Greener, *The Gun and Its Development*, 81-82 (9th ed. 1910). A 16-round wheel lock dates from about 1580. Kopel, at 852.



Production of repeaters continued in the seventeenth century. Brown, at 105-6 (four-barreled wheel-lock pistol could fire 15 shots in a few seconds); John Nigel George, *English Guns and Rifles*, 55-58 (1947) (English breech-loading lever-action repeater, and a revolver, made no later than the British Civil War, and perhaps earlier, by an English gun maker).

The first repeaters to be built in large quantities appear to be the 1646 Danish flintlocks that used a pair of tubular magazines, and could fire 30 shots without reloading. Like a modern lever-action rifle, the next shot was made ready by a simple two-step motion of the trigger guard. These guns were produced for the Danish and Dutch armies. Brown, at 106-7.

In Colonial America, repeating arms were available for people who could afford them, or who were skilled enough to make their own. For example, in September 1722, John Pim of Boston entertained some Indians by demonstrating a firearm he had made. Although “loaded but once,” it “was discharged eleven times following, with bullets in the space of two minutes each which went through a double door at fifty yards’ distance.” Samuel Niles, *A Summary Historical Narrative of the Wars in New England*, Massachusetts Historical Society Collections, 4th ser., vol. 5, 347 (1837). Pim’s gun may have been a type of the repeating flintlock that became “popular in England from the third quarter of the 17th century,” and was manufactured in Massachusetts starting in the early eighteenth. Harold L. Peterson, *Arms and Armor in Colonial America 1526-1783*, 215-17 (Dover reprint 2000) (Smithsonian Institution 1956). Another repeating flintlock, invented by Philadelphia’s Joseph Belton, could fire eight shots in three seconds. *Idem*, 217. Pim also owned a .52 caliber six-shot flintlock revolver, similar to the revolvers that had been made in England since the turn of the century. Brown, 255. A variety of multi-shot pistols from the late eighteenth century have been preserved, holding two to four rounds. Charles Winthrop Sawyer, *Firearms in American History: 1600 to 1800*, 194-98, 215-16 (1910).

The repeaters described above were *not* the most common arms. It would take two decades for the program begun by President Madison to result in repeating arms beginning to become affordable to the middle class. So in the seventeenth and eighteenth centuries, a person who could not afford an expensive repeater, but who wanted to be able to fire more than one bullet without reloading, would often buy a blunderbuss. The blunderbuss was the size of a very large handgun. Its muzzle flared outward slightly, like a bell. This made it easier to load while bouncing in a stagecoach, or on a swaying ship. The blunderbuss could fire either one large projectile, or several at once. Most often it was loaded with about 20 large pellets, and so it was devastating at short range. The name seems an adaptation of the Dutch “donder-buse” or “thunder gun.”

Excellent for self-defense at close quarters, the blunderbuss was of little use for anything else, having an effective range of about 20 yards. Militarily, it was used by sailors to repel boarders. Stagecoach guards and travelers carried blunderbusses, and it was also a common arm for home defense. For more on the blunderbuss, see Brown and George, above.

No one would dispute that modern arms are much improved from 1791 in terms of reliability, accuracy, range and affordability. But the gap from the 22-shot Girandoni (powerful enough to take an elk) to a modern firearm is pretty small compared with the changes in technology of “the press.” Compared to the one-sheet-at-a-time printing presses of 1791, the steam and rotary presses invented in the 19th century made printing vastly faster — a speed improvement that dwarfs the speed improvement in firearms in the last 500 years. When the First Amendment was written, a skilled printer could produce 250 sheets in two hours. Today, a modern newspaper printing press can produce 70,000 copies of a newspaper (consisting of dozens of sheets) in an hour. Now, with digital publishing, a newspaper article can be read globally within minutes after it is written.

This means that irresponsible media can cause far more harm today than they could in 1791. For example, in 2005, Newsweek magazine published a false story claiming that American personnel at Guantanamo Bay had desecrated Korans belonging to prisoners there. Eventually, Newsweek retracted the story. But the phony story had already spread worldwide, setting off riots in six countries, in which over 30 people were killed. Had Newsweek been using 18th-century printing presses, the false story would have mostly been read by several thousand people in the New York City area, where Newsweek is based. It would have been months — if ever — before the Newsweek issue with the false story was read by anyone in Pakistan or Afghanistan.

We do not limit any constitutional right to the technology that existed in 1791. In *District of Columbia v. Heller*, the court observed:

Some have made the argument, bordering on the frivolous, that only those arms in existence in the 18th century are protected by the Second Amendment. We do not interpret constitutional rights that way. Just as the First Amendment protects modern forms of communications, e.g., *Reno v. American Civil Liberties Union*, 521 U. S. 844, 849 (1997), and the Fourth Amendment applies to modern forms of search, e.g., *Kyllo v. United States*, 533 U. S. 27, 35-36 (2001), the Second Amendment extends, *prima facie*, to all instruments that constitute bearable arms, even those that were not in existence at the time of the founding.

This is an accurate statement of constitutional law, but it understates how truly frivolous the argument against modern firearms is. The people who ratified the Bill of Rights certainly did *not* anticipate the invention centuries later of the Internet or of thermal imaging sensors. The American people of 1791 did not have to anticipate the invention of repeating arms, because such arms had been in existence for centuries.



# EXHIBIT 21



## The History Of Henry

Patrick Roberts - August 26, 2022



**The history of Henry rifles is intrinsically tied to the taming of the American frontier, so let's take a deeper look at the first commercially successful lever-action.**

These days, rifles like the AR-15 have seduced the younger generation of gun owners, causing them to overlook the lever-action rifle's versatility, simplicity and reliability. Lever actions aren't just for old guys living out their John Wayne fantasies; they're still very usable rifles in a practical sense, as well as being extremely fun to shoot.

Few rifle designs have been as impactful on American history as the 1860 Henry rifle. Seeing as it was the basis for the rifle that won the West, the Winchester 1873, Benjamin Tyler Henry had more of an impact on the United States exiation westward than he could have dreamed of. I doubt that when Henry watched the first 1860 Henry rifles leave the factory, he suspected that, 160 years later, his name would grace nearly 300,000 firearms a year.



*The revival of the 1860 Henry brought some slight modernizations to improve the rifle. Today, it's available in .44-40 WCF and .45 Colt.*

That isn't a result of the rifle's initial success, but rather the impact the design had on Anthony Imperato, who partnered with his father, Louis, to bring the Henry name back to the firearm world in 1996. Since the first Henry H001 Classic Lever Action .22 LR rolled off the production line, over a million have made their way into the hands of nostalgic Americans. Sure, there isn't a direct connection to Benjamin Tyler Henry, but you have to appreciate Henry Repeating Arms' role in keeping the timeless lever-action design alive and well.

Without Henry, younger generations of shooters wouldn't know anything other than AR-15s and the like. Attainable, American-made lever-action rifles ensure that today's gun-loving youth won't overlook the lever-action rifle's versatility, simplicity and reliability. Nothing else seems to replicate the magic of a well-built lever-action.

## The First Henry Rifle

You can't talk about Henry Repeating Arms without talking about the 1860 Henry Rifle; it did become the basis for virtually every rifle Winchester produced following it. The design actually dates back to 1848, when Walter Hunt built a couple prototypes of his revolutionary lever-operated rifle, but there were still some design issues that needed to be worked out.

Several other men tried their hand at improving the action, and it was finally produced in some volume by the Volcanic Repeating Arms company. Production at Volcanic lasted only a year with an unknown number of rifles built, when Oliver Winchester took over the company and reorganized as New Haven Arms Company, where Benjamin Tyler Henry put the final touches on what we think of the classic Henry rifle while working as plant superintendent.

*A Smith & Wesson No.2 pistol and Volcanic rifle, both lever-action designs that predate Henry's. Photo: Rock Island Auction Company.*

With the improvements to the rifle and a brand-new cartridge, the .44 Henry rimfire, the 1860 Henry saw limited success with roughly 14,000 rifles produced.

## Load on Sunday, Shoot All Week

Just because the Henry didn't see the large-scale adoption the Spencer rifle saw shouldn't fool you; Henry's rifle makes appearances in some notable events in American history. Even President Abraham Lincoln was given a beautifully engraved gold-plated rifle, as was the Secretary of War and the Secretary of the Navy. The obvious goal was mass adoption of the Henry rifle, but New Haven fell short of their goal, with only 1,731 of the rifles being delivered to the U.S. Government.

*The first Henry rifles to be produced featured an iron receiver; the brass receiver didn't make an appearance until later in production. Photo: Rock Island Auction Company.*

With such a small purchase, the Henry was never formally adopted, but more than 6,000 of the rifles ended up in the hands of Union troops who purchased them out of their own pocket rather than use the issued Spencer rifle. The Henry's 15-round capacity made it particularly attractive to raiding parties, scouts and those assigned with flank guard duty.

When Confederate Colonel John Mosby referred to the Henry as "that damned Yankee rifle that can be loaded on Sunday and fired all week," it was clear that Henry's rifle had an impact. That all ended in 1866, when production of the Henry rifle ceased, and New Haven Arms was restructured again as Winchester Repeating Arms. The rifle would go on to be developed into the Winchester 1866, which saw a long, 33-year production run and wide-scale adoption with foreign armies and those seeking fame and fortune in the West.

*The 71st Illinois Infantry Regiment color guard pose with their 1860 Henry rifles.*

## **The Henry Name Is Resurrected**

Once production of the 1860 Henry ended, the Henry name faded into obscurity until Anthony Imperato trademarked the name in 1996. Anthony and his father, Louis, set up a manufacturing facility in Brooklyn, New York, to produce the Henry H001 .22 rimfire lever-action 131 years after the last rifle to bear the Henry name came off the assembly line.

Since there isn't any affiliation with Benjamin Tyler Henry or New Haven Arms Company, the company started by the Imperatos wasn't really bringing a defunct company back, but rather the birth of a brand-new one that paid homage to an influential design.

With a blank canvas, Henry Repeating Arms has grown to a size that Benjamin Tyler Henry would've never even dreamed of in the mid 1800s, with no signs of slowing down. Today, Henry employs nearly 500 people and has over a quarter-million square feet of manufacturing space between their headquarters in Bayonne, New Jersey, and Henry's second facility in Rice Lake, Wisconsin.

When the slogan "Made in America Or Not Made at All" was chosen, they weren't playing around. Every Henry is born in the United States; there are no exceptions ... ever.



*Over a million .22 Henry lever actions have been produced since the model was introduced in 1997.*

### **A Model for Every Need**

With two facilities that you could pack over five football fields into, it shouldn't be a surprise that their product lineup is pretty dang expansive. Boiling it down to the basic models without taking into account variations in barrels, finish and caliber, Henry has something like 12 models to choose from. That number jumps to 253 when you start adding in caliber, finish and other variations.

Even if you only have a cursory interest in owning a lever-action, there's likely something in the Henry catalog that you'll appreciate in their trademark brass finish, polished silver, black or my personal favorite option, case colored.

### **The Classic Henry H001 .22 Rifle**

If you're looking to scratch the Old West itch, there are few better choices than a Henry H001. Over a million have made it to the market as of 2017. Currently, the H001 isn't offered in a side gate variant, and no plans to offer one have been announced. It isn't hard to understand why when you take into consideration that the palatable \$405 MSRP would increase quite a lot to offset the increased complexity of a side gate H001. That isn't to say that it wouldn't be awesome, because it would.

The rifle is chambered in .22 LR, but it'll also shoot .22 Long and .22 Short ... offering more versatility than a 10/22. The overall feel of the rifle is very retro, with adjustable buckhorn sights and American walnut furniture. Loading is done just like all Henry rifles, by removing a removable plunger tube from the magazine, sliding the rounds in and then replacing the plunger tube.

Variants ranging from the standard H001 to customized special editions are available; there's no shortage of choices.

### **The Mare's Leg Pistol**

One of the more unique firearms in the Henry lineup is their Mare's Leg, a lever-action pistol modeled after Steve McQueen's character on the late '50s TV show *Wanted: Dead or Alive*. The pistol is available in .22 Long Rifle, .22 Magnum, .357 Magnum,

.44 Magnum and even .45 Colt. Unfortunately, the Mare's Leg isn't offered with Henry's new side gate, but that's bound to happen sooner or later.

## Henry Big Boy Rifles

Like the first lever-actions, the Henry Big Boy rifles are chambered in what ends up being an intermediate cartridge. Offered in .357 Magnum, .44 Magnum and .45 Colt, the Big Boy might be an ideal option if you're looking for a rifle that shares the same cartridge as your revolver.

*Listening to their customer base, Henry added a side loading gate to their rifles in April of 2019.*

While you might think you need a .30-30 Winchester or even the Long Ranger to take medium game, the Big Boy will do it in a handier package with less recoil. The .357 Magnum case color is a personal favorite, with a 125-grain out of a 20-inch barrel performing very similar to a 7.62x39mm or .300 Blackout in a carbine.

A Big Boy might even be a great choice for a defensive rifle should you live in a restrictive area, or if you feel more comfortable with a lever gun than a semi-auto.

## Large-Caliber Lever-Actions

Henry's large-caliber lever actions are very similar to the Big Boy rifles—they're just chambered in .30-30, .45-70 Government, .38-55 Winchester and .35 Remington.

The large-caliber rifles were the first to be updated with the new side gate and maintain the removable plunger, should you prefer to use the tube to load rather than the side gate. The ability to remove the magazine tube plunger means that downloading your rifle after a hunt won't put unneeded wear on your ammunition. Options aren't a bad thing sometimes.

## Pump-Action Rimfire, The Long Ranger & Shotguns

If your particular brand of nostalgia is reliving those times at the fair with a pump-action .22, the Pump Action Octagon might be what you need. Sadly, there aren't any other pump-action rifles in the Henry product line.

How about something for hunting longer ranges than a .30-30 Win. is capable of? The Long Ranger is aptly named—it's chambered in .308 Winchester or 6.5 Creedmoor. Since the ammunition wouldn't work so well in a tube magazine, Henry fitted this rifle with a detachable box magazine, and the rifle's mechanism is significantly different than the rest of their line because it relies on a rotating bolt. As weird as it sounds, the idea of a 6.5 Creedmoor lever action can be appealing due to its uniqueness.

*If you're looking to shoot past 150 yards, the Henry Long Ranger is well suited in .308 Win. or 6.5 Creedmoor. The detachable magazine allows it to be chambered in cartridges using a spire-point bullet.*

The lineup gets a bit weird when we look at their shotguns: Not only does Henry offer 12- and 20-gauge single-shot break actions, but they also offer a lever-action .410 shotgun based off the large-caliber lever-action rifle, as well as the Lever Action Axe. The Axe is a non-NFA firearm and, like all their lever-action .410 shotguns, it features a side gate loading port.

### **New Original Henry Rifles**

The most coveted of Henry rifles is, without a doubt, the New Original Henry Rifles. Carrying an MSRP of \$2,590, it might seem like they're priced crazy high when compared to the rest of the Henry line, but that changes the second you realize a New Haven produced 1860 Henry rifle will set you back about the same money as a brand-new Porsche 911.

If you want an 1860 Henry you can actually enjoy on the range, the Henry New Original Henry is the ticket.

### **Modernized X Models**

In an effort to bring the lever action into the 21st century, Henry introduced the X Model with the features that a younger-generation shooter might look for, such as M-Lok slots and a rail to mount a bipod or flashlight. The biggest benefit is the fiber-optic sights and the threaded barrel. With suppressed hunting legal in many states, the ability to add a can is a welcome option.

*The Model X features M-Lok slots, Picatinny rail, threaded barrel, fiber-optic sights, enlarged lever loop and synthetic furniture.*

Integrated sling mounting points, a side gate loading port and synthetic furniture make the X Model a workhorse that's sure to serve someone for decades.

What does the future hold for Henry Repeating Arms? Well, those secrets are kept locked up pretty tight, but hopefully a wood-stocked variant of the X Model is on the books. Whatever the case, the Henry brand is here to stay for generations to come.

**Editor's Note:** *This article originally appeared in the 2021 USA special issue of [Gun Digest the Magazine](#).*

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### PATRICK ROBERTS

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# EXHIBIT 22



# To the Honourable Continental Congress

May it Please your Honours,

I would just inform this Honourable Assembly, that I have discovered an improvement, in the use of Small Armes, wherein a common small arm, may be made to discharge eight balls one after another, in eight, five or three seconds of time, & each one to do execution five & twenty, or thirty yards, and after so discharged, to be loaded and fired with cartridge as usual, which I am ready to prove by experimental proof, and can with equal ease fix them so as to discharge sixteen, or twenty, in sixteen, ten or five seconds of time, which I have kept as yet a secret, thinking that in two, or three Months we might have an army thus equipt, which our enemy should know nothing of, till they should be made to know it in the field, to their immortal sorrow -

And if you Gentlemen are desirous to enquire into this improvement, your Humble Servant, is ready to wait upon you at any time, or place, or he may be waited on at the Widow Forde's, in Walnut street, between second & third street.

from Your most Obedient

Humble Servant

Joseph Belton

Philadelphia April 11<sup>th</sup> 1777



# EXHIBIT 23

# Forgotten Weapons: The Mitrailleur

**PM** [popularmechanics.com/military/weapons/a18459/forgotten-weapon-mitrailleur](http://popularmechanics.com/military/weapons/a18459/forgotten-weapon-mitrailleur)

December 9, 2015

Media Platforms Design Team

The mitrailleur was one of the early types of mechanical machine gun, along with the Gatling, Gardner, Nordenfolt, and others. "Mitrailleur" is actually a general name for a volley gun—one with many barrels in a cluster, which are fired sequentially. The two most common types were the Montigny (a Belgian design fired by a lever) and the Reffye (a French design fired by crank).

The Reffye was a top-secret weapon used by the French in the Franco-Prussian War, which was expected to be a huge game-changer. However, there was little experience worldwide in how best to use a weapon like this, and the French commanders chose to use them like artillery, firing at long range where they were inaccurate and underpowered. In this role, they were utterly outclassed by the Prussian Krupp artillery, leading to a general European disdain for the effectiveness of machine guns that would last until the First World War.

Reffye mitrailleur in use, firing blanks:

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Excellent CAD animation of a Reffye:

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The Montigny was typically a 37-barreled affair, using a removable cartridge plate for loading which allowed it to maintain a very high rate of fire (as long as loaded plates were available to the gunners). The breech was a large block containing 37 separate firing pins, which the cartridge plate attached to the front of. A large lever at the rear of the gun connected to a knee-joint type cam that would push the breechblock forward, chambering the 37 cartridges and locking the breechblock in place. A second lever on the side of the gun would then be pulled up vertically, firing the barrels in succession.



IMAGE NO LONGER  
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### Belgian Montigny mitrailleuse

#### Media Platforms Design Team

The firing mechanism was quite simple. When the breechblock was pulled rearward, all of the firing pins would be cocked against their own individual springs, and a plate would slide up between the firing pin and its port in the front of the breechblock. The firing lever simply pulled that blocking plate downward, allowing the firing pins to snap forward against their cartridges in sequence. The rate of fire would be determined by the speed with which the firing lever was pulled, and could be as slow as single shots if the gunner was careful.

Once the cartridges had all been fired, the rear lever would be used to unlock the breech and pull it backwards. The cartridge plate (now full of empty cases) would be pulled out the top of the gun, and a fresh loaded one put in its place. This sequence would be repeated as

desired until the gun overheated or ammunition ran out.



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Loading plate for a Montigny mitrailleuse

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The Mitrailleuse as a general type of firearm saw only one major combat usage, and that was the Franco-Prussian War of 1870-1871. The French had adopted the Reffye Mitrailleuse and considered it a game-changer. Unfortunately for the French, the tactical understanding of how to use a weapon like the Mitrailleuse was still totally lacking. The guns were treated like artillery, and used to fire at ranges of 1500 meters or more against German infantry. The sights on the Mitrailleuse were simple post and notch affairs like rifles of the day, and the extreme range required excellent range estimation (which the gunners were not trained for).

To compound the problem, the combination of long range and small projectiles made it nearly impossible to observe point of impact when firing, and it was nearly impossible to actually hit targets as a result.

The problems with French use of the Mitrailleuse were compounded by the secrecy surrounding the guns. The Army was so focused on preventing the Germans from discovering the guns that virtually no training was given to troops on their use—few had even seen them prior to battle. The secrecy had not been particularly effective, though, and the Prussians knew about the guns. Concerned about their potential effectiveness, they were made a high-priority target for the very effective Prussian field guns, which could easily destroy them from well beyond the range of return fire.

As a result of their utter failure to provide the French Army with an advantage, a general feeling of the inferiority of all such rapid-fire rifle-caliber weapons would permeate military culture for several decades. Ultimately, it was only the use of Maxim guns in WWI that would change the minds of generals and ordnance departments worldwide (although a forward-looking few did learn from conflicts like the Russo-Japanese War).



# EXHIBIT 24

# The Promise of American Repeating Weapons, 1791-1821

*Posted on October 20, 2016 by Age of Revolutions  
Reading time 14 minutes*

By Andrew Fagal (<https://princeton.academia.edu/AndrewFagal>)

In May 1792, Joseph Gaston Chambers almost revolutionized world history when he approached the U.S. War Department with a musket that could, he claimed, fire 20 rounds in a minute.[1] Although Chambers failed to gain patronage from interested parties in the early 1790s, his weapons (repeating muskets, pistols, and seven-barreled swivel guns) were adopted by the U.S. Navy and the Commonwealth of Pennsylvania during the War of 1812, and were much sought after by European powers. By the early 1820s, however, the complexity, and inherent danger of the firing mechanism led to their wholesale abandonment. Chambers' repeating guns stood at the nexus of diplomacy and technological advancement in the Age of Revolutions. Yet, the promise of rapid-fire arms was not taken for granted, nor did those who encountered it ascribe a quasi-mythical "American" quality to the nascent technology — often the case in today's political culture.

The unreliability of Chambers' technology was apparent from the time he approached the War Department in the spring of 1792 with the promise of repeating arms. The previous year, the U.S. Army had suffered a disastrous defeat as it marched on native villages, and Congress soon blamed the setback on the quality of the weapons issued to the troops.[2] Given the Congressional report, Henry Knox was presumably eager to entertain ordnance solutions to the problem of western expansion, so when Chambers informed Knox about his invention, the Secretary of War quickly ordered a subordinate to supply the inventor with a musket, and organized a demonstration at Alexander Hamilton's "Seat" on the Schuylkill.[3]

The demonstration for the War Department was apparently a failure. In a letter (<http://founders.archives.gov/?q=%25252522Joseph%25252520G.%25252520Chambers%25252522&s=1111311111&sa=&r=1&sr=>) to Secretary of State Thomas Jefferson, Chambers explained that his project really deserved the "Attention of public men" despite the fact that by firing 20 bullets out of a common musket "some have bursted." Now he hoped that Jefferson could help him communicate his plan to the "Friends of Liberty and the Rights of men in Europe." [4] Chambers explained to Jefferson that through his loading design he could "charge a Gun barrel full from one end to the other and upon occasion to fire these off successively at any desired intervals." The loading design (identified in a British intelligence report dating from the aftermath of the War of 1812, shown below) required a lock affixed to the front of the gun barrel. That lock, triggered by a cord, would ignite the first powder charge, thus firing the first projectile. A

perforated protrusion in the cylindrical-shaped bullet would carry the charge down the barrel and fire the second bullet, and so on. The gun's normal trigger would be reserved for a bullet remaining at the rear of the chamber. These repeating weapons were explicitly for "making havoc of the human species."

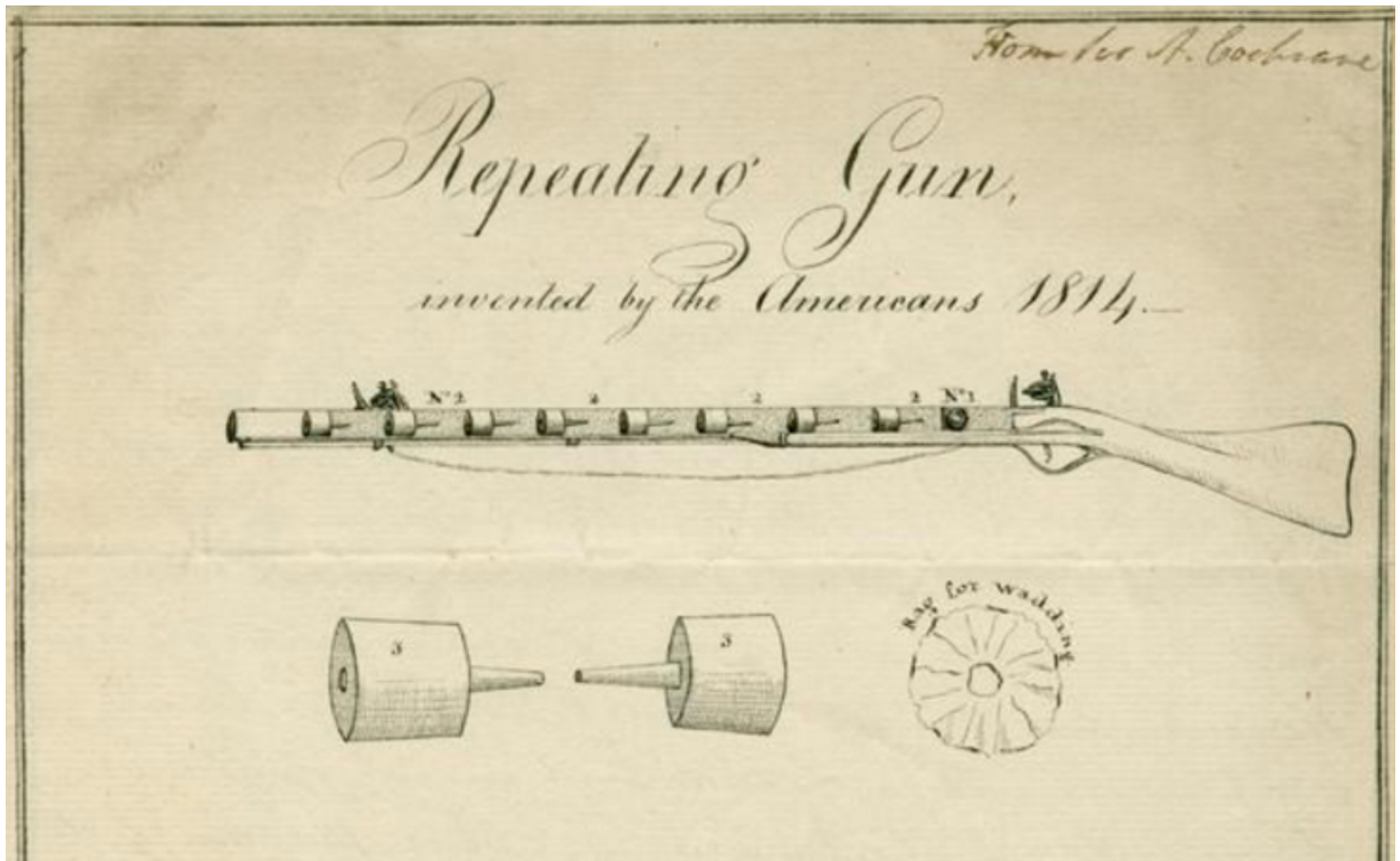


Image: Description of a machine invented by Colonel Chambers of Pennsylvania, circa 1815, War of 1812 ([http://webapp1.dlib.indiana.edu/findingaids/view?brand=general&docId=InU-Li-VAC1213.xml&doc.view=entire\\_text%2523mets=http://purl.dlib.indiana.edu/iudl/lilly/mets/VAC1213-01855\)mss.](http://webapp1.dlib.indiana.edu/findingaids/view?brand=general&docId=InU-Li-VAC1213.xml&doc.view=entire_text%2523mets=http://purl.dlib.indiana.edu/iudl/lilly/mets/VAC1213-01855)mss.), Lilly Library, Indiana University, Bloomington, Indiana.

Jefferson coolly responded (<http://founders.archives.gov/?q=%25252522Joseph%25252520G.%25252520Chambers%25252522&s=1111311111&sa=&r=3&sr=>) that

Chambers' designs "will not want patronage any where," because all nations desired the means to destroy the "greatest number possible of their enemies." [5] However, seeing the value of the weapon for the United States, he suggested that Chambers instead address his plans to the U.S. patent office. Given the inventor's apparent zeal for the French Revolution, he instead chose to approach their new minister to the United States, Edmond Genet. [6] As with his demonstration to the War Department, Genet must not have been overly impressed when he saw the weapon in May 1793. He merely suggested that Chambers forward on the plans of the design to the French government in Paris for them to decide upon. [7] Following Genet's gentle rebuff, and the lack of interest from the War Department, Chambers retired (<http://founders.archives.gov/?q=%25252522Joseph%25252520G.%25252520Chambers%25252522&s=1111311111&sa=&r=6&sr=>) to his

farm in Western Pennsylvania and stopped his tinkering. [8]

Chambers' repeating guns lay dormant for the next twenty years as the United States pursued a careful path of neutrality (excepting the Quasi-War) in the conflicts of the French Revolution and Napoleon. But when the United States declared war against Great Britain in June 1812, he saw an opportunity to have

his weapons used in combat as the Jeffersonian Republicans increasingly supported technological solutions ([https://www.academia.edu/7397008/Terror\\_Weapons\\_in\\_the\\_Naval\\_War\\_of\\_1812](https://www.academia.edu/7397008/Terror_Weapons_in_the_Naval_War_of_1812)) to military problems.[9] Just as in 1792, the War Department rejected Chambers' designs. But seeing their potential, the Navy quickly adopted the technology and between September 1813 and April 1814 contracted with Philadelphia arms manufacturers to produce at least 53 seven-barreled swivels that could fire over 200 bullets apiece (alongside components to assemble 30 more), 200 repeating muskets, and 100 repeating pistols.[10] By the summer of 1814, Chambers' repeating weapons had been delivered to the navy, deployed by Commodore Isaac Chauncey on Lake Ontario, and at least one was intercepted by British naval intelligence.[11]

Although it is unclear whether or not the United States ever actually used the Chambers guns in combat, what is clear is that the designs attracted the attention of a number of foreign governments. Chambers reported to his son in the summer of 1813 that "The French Minister had heard in the conversations of Mr. Jones report of the nature of my experiments – and had sent me an invitation to take a Dinner "*sans ceremonie*" at his residence &c. – I was made acquainted with the Object – and took my Musket & Pistols along. We went into a retired place & performed an experiment." [12] The minister then warned him that if he wanted contracts with Napoleonic France, he should keep his project a secret from the Russian consul in Washington. Not to be outdone by the French, the British, who had captured several of the weapons in 1814, quickly had reproductions made in Britain the following year. Their test reports demonstrated that the guns worked, but British finances were too overextended to follow up on new technologies in the aftermath of the Napoleonic Wars. The Dutch navy found out about the repeating guns in 1816 and tasked at least one officer to surreptitiously obtain one from the Americans. The Dutch *chargé d'affaires* in America, Viscount de Goupy de Quabeck, had better luck than the navy in actually getting the guns. He was simply able to purchase several from one of the Philadelphia manufacturers. Upon testing the weapons at Liège, one of the seven-barreled swivels burst, and after a candid interview with Commodore William Bainbridge on the overall effectiveness of the guns, the Dutch soon substituted their interest in American repeating firearms with that of John Hall's breech loading rifle.[13] The Spanish, too, had a great interest in the repeating guns, and Luís de Onís credited (<https://books.google.com/books?id=ktHAQAAMAAJ&printsec=frontcover&dq=memoir+upon+the+negotiations+between+spain+and+the+un>) these weapons for American victories on the Great Lakes. But he lamented in 1820 that, "I sent one of them to the government of Havana...nothing has been done" to reverse engineer the weapon and get it into production.[14] From there, the Chambers firearms virtually disappear from the documentary record.

Although I can only make a tentative conclusion, it appears that the weapons failed to catch on, because the technology was too unreliable and the U.S. Navy never orchestrated a method of technology sharing between the various contractors to improve the design (as the Ordnance Department did with the manufacture of small arms). Certainly, Chambers' firearms design *could* work as intended, but it seems that there was one key flaw: if the gunpowder improperly ignited, the gun was basically a giant pipe bomb. As the design above shows, the proper firing would begin when the front lock was fired by the use of a cord. If, however, the rear lock was fired first, the gun would simply blow up in its owners face. Unreliable weapons were then, as now, the bane of soldiers' existence.

In the 200+ years since Joseph Chambers first unveiled his repeating arms technology, self-loading firearms have become ubiquitous around the world. Although modern small arms technology is not based on Chambers' designs, his prediction to Edmond Genet still rings true today: "I have not the smallest doubt of the Efficacy of my project insomuch that when this method shall become publicly

known the common practice of arms will be but mere squibbling to it." The Atlantic World in the Age of Revolutions was a violent place, and the widespread interest in Joseph G. Chambers' repeating guns further demonstrates that reality.

### Author Bio

Andrew J. B. Fagal is an assistant editor with the Papers of Thomas Jefferson at Princeton University. His articles on armaments and national policy in the War of 1812 era have appeared in *New York History* and *The New England Quarterly*. He is currently working on a book manuscript on the political economy of war in the early republic. You can reach Andrew at [afagal@princeton.edu](mailto:afagal@princeton.edu) (<mailto:afagal@princeton.edu>) or on Twitter by following [@Andrew\\_Fagal](https://twitter.com/Andrew_Fagal) ([https://twitter.com/Andrew\\_Fagal](https://twitter.com/Andrew_Fagal)).

**Title image:** Chambers Gun, circa 1814, Département des Armes du Grand Curtius, Liège, copyright "Ville de Liège – Grand Curtius."

### Endnotes:

- [1] For biographical information on Chambers see, "Joseph Gaston Chambers," in *Princetonians: A Biographical Dictionary, 1791-1794*, J. Jefferson Looney and Ruth L. Woodward eds. (Princeton: Princeton University Press, 1991), 481-8. The most significant study of Chambers' designs, to date, is William Gilkerson, *Boarders Away II: With Fire* (Lincoln, R.I.: Andrew Mowbray, Inc., 1993), ch. 9.
- [2] Causes of the Failure of the expedition Against the Indians, in 1791, Under the Command of Major General St. Clair, *American State Papers, Military Affairs*, 1:36.
- [3] R. J. Vandenbrock to William Knox, May 2, 1792, *The Papers of the War Department, 1784-1800*; Joseph Chambers to Henry Knox, May 3, 1792, *The Papers of Henry Knox*, microfilm edition, reel 31; Chambers to Knox, May 4, 1792, *ibid*.
- [4] Joseph G. Chambers to Thomas Jefferson, August 13, 1792, *The Papers of Thomas Jefferson*, Julian P. Boyd et. al. eds. (42 vols. to date, Princeton: Princeton University Press, 1950-), 24:290-3.
- [5] Jefferson to Chambers, November 5, 1792, *PTJ*, 24:580.
- [6] Joseph G. Chambers to Edmond Genet, May 10, 1793, *The Papers of Edmond Genet*, microfilm edition, reel 5.
- [7] Chambers to Genet, May 15, 1793, *ibid*.
- [8] Chambers to Jefferson, May 20, 1801, *PTJ*, 34:147-8.
- [9] Andrew J. B. Fagal, "Terror Weapons in the Naval War of 1812," *New York History* 94 (Summer/Fall 2013): 221-40.
- [10] *Letter from the Secretary of the Navy, Transmitting a Statement of Contracts made by that department, during the years 1813 and 1814*, Early American Imprints, Shaw-Shoemaker #33262 (Washington: A& G Way, 1814).
- [11] Isaac Chauncey to William Jones, June 24, 1814, with enclosure, and Charles Cunliffe Owen to James L. Yeo, July 17, 1814 in *The Naval War of 1812: A Documentary History*, Michael J. Crawford ed. (3 vols., Naval Historical Center: Washington, 2002), 3:532-7.



[12] Joseph G. Chambers to Daniel Chambers, July 4, 1813, American Antiquarian Society, David Chambers Papers, Mss manuscript boxes C.

[13] For information on the British and Dutch attempts to reproduce the weaponry see Gilkerson, *Boards Away II*, 122-3,133-9.

[14] Luis de Onis, *Memoir upon the Negotiations Between Spain and the United States of America, Which Led to the Treaty of 1819* (Baltimore: Fielding Lucas, 1821), 60-1.

#### 4 COMMENTS

## 4 thoughts on “The Promise of American Repeating Weapons, 1791-1821”

1. Pingback: Bearing Arms in the Age of Revolutions Panel Introduction – Age of Revolutions
2. Pingback: Bordering on the Frivolous? The Right to Bear Arms Yesterday and Today – Age of Revolutions

3.  
**SCOT**

says:

October 11, 2020 at 11:59 pm

You forgot to mention Joseph Belton, who approached Congress in 1777 with an offer to convert muskets to fire up to 20 shots in as little as 5 seconds. He even demonstrated it to a group including David Rittenhouse and Horatio Gates, who attested to its function, and Congress was interested until Belton told them how much he wanted for it.

[https://en.wikisource.org/wiki/Correspondence\\_between\\_John\\_Belton\\_and\\_the\\_Continental\\_Congress](https://en.wikisource.org/wiki/Correspondence_between_John_Belton_and_the_Continental_Congress)

Belton’s gun was almost certainly a sliding lock design, firing one or more fused chains of cartridges. Unfortunately, no examples survive, and all we have as evidence for this example is his correspondence with Congress.

Belton later moved back to England, where he went on to sell various other superimposed load guns, including this 7 shot, magazine fed, breech loading flintlock, bought and issued by the East India company. <https://www.youtube.com/watch?v=-wOmUM40G2U>

#### REPLY

4.  
**PAUL**

says:

March 9, 2023 at 9:22 am

pew pew

#### REPLY

# EXHIBIT 25





<https://www.biodiversitylibrary.org/>

**The Philosophical magazine and journal : comprehending various branches of science, the liberal and fine arts, agriculture, manufactures, and commerce**

London, R. Taylor, 1814-1826

<https://www.biodiversitylibrary.org/bibliography/60498>

**v.59 (1822:Jan.-June):** <https://www.biodiversitylibrary.org/item/53104>

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## NEW COMPASS.

Mr. William Clark, a messenger in Chatham Dock-yard, has invented a mariner's compass on an entirely new principle. The needle consists of four arms or poles, placed at right angles, and uniting in one common centre. The two northern poles are secured to the N.W. and N.E. and the two southern poles to the S.E. and S.W. points of the card, which places the four cardinal points right between the angles of the needle, and allows the card to point north and south as heretofore, the cards now in use answering the purpose. This compass has been tried under different circumstances, and, as far as can be ascertained by the experiments already made, is allowed to possess the principles of polarity and stability beyond that of any compass now in use.

## NEWLY INVENTED MUSKETS.

[From the New York Evening Post of April 10.]

A curious invention in fire-arms has lately been accomplished by an ingenious mechanic of this place, by the name of Isaiah Jennings; and in point of importance, both for public and private use, it is probably not equalled by any invention of the present age. It is a single barrel and lock, stocked in the usual manner, and is perfectly simple, safe, and convenient. The number of charges may be extended to fifteen or even twenty—each charge being under as complete controul as a single charge in an ordinary gun; and may be fired in the space of two seconds to a charge, or at longer intervals, at the option of the possessor, with the same accuracy and force as any other gun. The principle can be applied to any musket, rifle, fowling piece, or pistol, and can be made to fire from two to twelve times, without adding any thing to the incumbrance of the piece, except five or six ounces to its weight. Thus the soldier is put in possession of a gun, out of which he can throw twelve or fifteen charges at his enemy, at the commencement of an engagement, as fast as he can cock and pull trigger, and be left in possession of a simple gun, to load and fire single charges like any other gun, with the advantage of its priming itself. The cavalry may be furnished with holster pistols containing five or six charges, which can be used on horse-back, with the same convenience as ordinary pistols. The navy can be furnished with muskets for marines in close engagements, and boarding pistols, unequalled by any thing in naval warfare. In defending a breach, the power of ten men is concentrated in one; and in arming our small garrisons on the Indian frontiers, their power might be increased fourfold at an inconsiderable expense. And as a defence against the pirates that now throng our neighbouring waters, two or three of these guns, on board a



merchant vessel, in the hands of skilful marksmen, would be able to cut off a whole boat's crew before they could succeed in boarding a vessel.

As a sporting or hunting gun, its advantages are not less important. It enables the sportsman to meet a flock with twice the advantage of a double barrel gun, without any of its incumbrances, and it enables the hunter to meet his game in any emergency. This gun has been shown to many officers of our army and navy, and has been highly approved of, and indeed no one who has seen a fair trial of its powers has ever been able to find an objection to it.

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#### PRESERVATION FROM LIGHTNING.

Sir H. Davy, in his fourth lecture at the Royal Institution, recommends the following means of escaping the electric fluid during a thunder-storm. He observed that in countries where thunder-storms are frequent and violent, a walking-cane might be fitted with a steel or iron rod to draw out at each end, one of which might be stuck into the ground, and the other end elevated eight or nine feet above the surface. The person who apprehends danger should fix the cane and lie down a few yards from it. By this simple apparatus, the lightning descends down the wire into the earth, and secures him from injury.

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#### EGYPTIAN ANTIQUITIES.

A considerable addition has lately been made to the Antiquities deposited in the British Museum from Thebes, Memphis, and other parts of Egypt. They are dispersed for the present in different parts of the Museum till provision can be made for their proper arrangement. There are in a room below the building, a Typhonic statue imperfect, in as much as the right elbow and both the feet are wanting, holding the *lotus* stem in full blossom: remains of an elliptical globe crown the head.—A piece of rough Egyptian or Ethiopian marble, apparently part of a frieze, covered over on one surface with hieroglyphics in the running-hand of that character.—A portion of a frieze of a temple (red granite), its interior or projecting underside with figures in high relief, among which a vessel brim full of water, dropping its contents, being super-charged with abundance; exterior surface covered with linear symbols.—Remains of a colossal female statue, in white lime-stone or marble, including the bust to middle of waist. A leaf of *lotus* ornaments her forehead; beautiful workmanship, and finely expressive of Ethiopian beauty.—A figure in Egyptian lime-stone, or white coarse marble, representing a body swathed for rest, or for a funeral.—A lower portion, containing the legs, of a red granite statue.—A piece of yellow marble,



# EXHIBIT 26

# The Girandoni Air Rifle: The Lewis and Clark Expedition's Secret Weapon

**WH** [warfarehistorynetwork.com/article/lewis-and-clarks-girandoni-air-rifle](http://warfarehistorynetwork.com/article/lewis-and-clarks-girandoni-air-rifle)



***The .46-caliber Girandoni air rifle was a secret weapon on the Lewis and Clark Expedition.***

*This article appears in: January 2013*

**By Frederick J. Chiaventone**

When one thinks of the guns that won the West, one naturally envisions such familiar weapons as the Winchester, Henry, and Spencer repeating rifles, the trapdoor Springfield, the Smith & Wesson revolver, and the Colt Peacemaker. Thinking back even further, there were the older percussion-cap rifles such as the Hawken buffalo gun or its flintlock predecessors, the Kentucky and Pennsylvania long rifles. Largely unknown to the general public is a singular weapon that never belched out gunpowder or killed a single human being in the United States, but that was perhaps the single most influential weapon in the opening of the American West: the Girandoni air rifle, the secret weapon of the Lewis and Clark expedition.

The earliest known example of the Girandoni air rifle is currently on display at Stockholm, Sweden's Livrustkammeran Museum and dates to around 1580. Featured in fairly large calibers, these pneumatic weapons were employed by the very wealthy in hunting large

game such as deer and wild boar. But around 1780 an enterprising Tyrolean gunsmith named Bartolomeo Girandoni developed a rugged new model air rifle that was soon adopted by the Austrian military. Produced in .46-caliber, the Girandoni was a quantum leap forward in weapons technology.

## The Rapid-Fire Windbusche

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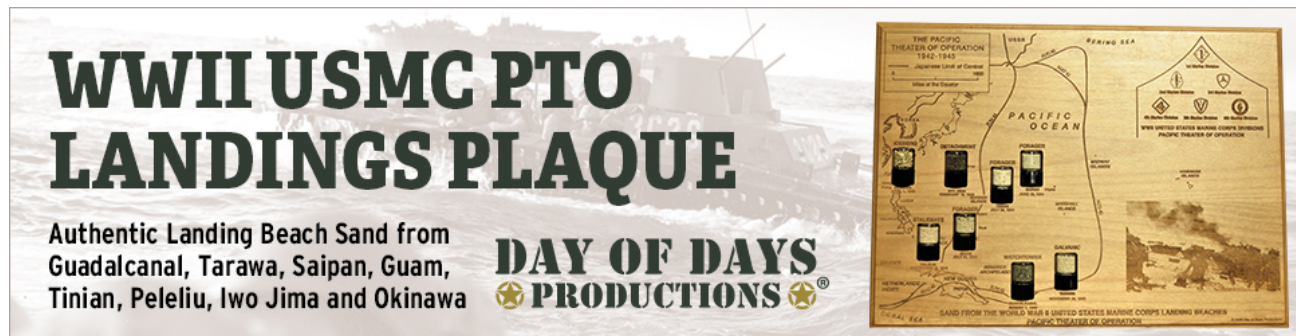
The rifle was four feet long and weighed 10 pounds. The butt of the weapon was an iron flask that could be detached, pumped full of air, and then refitted to the weapon. Each rifle was issued with three such air reservoirs. The Girandoni was approximately the same length and weight of a conventional musket and was loaded with 22 lead rifle balls that were propelled out of the weapon individually by controlled bursts of compressed air. Fed into a loading tube alongside the barrel of the weapon, these rifle balls were loaded into the weapon individually by a simple steel block, which slid back and forth at the base of the breech. Much like the popular modern-day Daisy Red Ryder BB gun, the rifle balls were fed into the breech with the aid of gravity, the muzzle of the weapon being held upright as the bullets rolled down toward the breech. One crucial advantage to this loading mechanism was the fact that the rifleman, rather than having to stand upright to load, could actually lie on the ground and simply hold the weapon up vertically.



Girandoni air rifle with compressed air in the stock. © National Firearms Museum

With a muzzle velocity of 1,000 feet per second, the windbuchse, literally “wind rifle,” could put a lead ball clean through a one-inch pine board at 100 yards. Its full magazine could be discharged completely in less than 30 seconds. In comparison, its contemporary gunpowder driven musket was considered accurate to only about 50 yards. In the European theater of war, this made for a fearsome weapon that discharged no dense smoke to obscure the battlefield or loud report to betray the position of the rifleman. It was also impervious to rain, which would quickly negate the usefulness of gunpowder.





## Logistical Challenges of the Girandoni Air Rifle

Austrian Emperor Francis II was especially intrigued by the technology and was intimately involved in fielding the Girandoni with the Austrian army. Early on, the emperor wrote that it was critical that the air rifle be “deployed correctly and maintained at the best standard. It is necessary that the simple soldier, whose intelligence is generally quite limited, is given this training immediately upon receiving the gun—and that the training is delivered in individual parts and not too much at once.”

Due to the weapon’s complexity, there were some significant logistical challenges to be overcome. Hand-operated air pumps (it took some 1,500 strokes to fill each air canister) were issued one per two riflemen with additional large scale, wheeled air-pumping carts placed behind the lines. Specially trained gunsmiths were also a necessity, one for each 100 riflemen, and they required a very specialized supply of spare parts—mainsprings, replacement seals, and extra air flasks. It was not an easy task. Many simple conscripts, frequently peasant lads with no understanding of technology, were incapable of grasping the concept of the weapon or maintaining it properly. Air flasks were frequently mishandled. Some fully charged flasks actually exploded when exposed for long periods to direct sunlight, and leather seals were allowed to dry out, rendering the weapon useless. Even with these challenges, the weapon proved exceptionally effective on the battlefields of the Austro-Turkish War (1787-1791), but despite some allegations to the contrary it never saw service against Napoleon.



Closeup of the Girandoni air rifle show how the gun's unique stock fit onto the barrel. It was known in Austria as a windbusche, or "wind rifle." © National Firearms Museum

Despite the deadly accuracy and firepower provided by the Girandoni, it proved to be a technological leap too great for the military minds of the period to handle. Austria-Hungary's general artillery director summed up the problems in his correspondence of July 21, 1789, when he reported: "Due to their construction, these guns were much more difficult to use effectively than normal, as one had to handle them much more cautiously and carefully. In addition, the soldiers using them had to be supervised extremely carefully, as they were unsure about the operation. The guns became inoperable after a very short time—so much so that after a while no more than one-third of them were still in a usable state. We needed the whole winter to repair and replace them."

### **The Air Rifle of Captain Meriwether Lewis: "Something From the Gods"**

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By 1810, the Girandoni had been entirely phased out. The Austrian military collected some weapons for its museums, while others were acquired by private individuals or simply lost. At least one, however, crossed the Atlantic and played a major role in a pivotal period of American history.

It is unclear how the weapon now on display at the Pentagon first came to the United States—possibly it was a surplus rifle that had been phased out of Austrian military service. Whatever its provenance, historians have determined that it was most likely purchased by

Captain Meriwether Lewis between May 9 and June 9, 1803, at Isaiah Lukens' instrument shop just outside Philadelphia. Lewis was en route to Pittsburgh at the time for the final construction and fitting out of the Corps of Discovery's keelboat. On the very first page of Lewis' personal journal kept on the trip, he recounts how he demonstrated the weapon's capabilities to the wonderment of the crowd. The Indians, he said, considered the rifle "something from the gods."

It was during its service with the Corps of Discovery that the Girandoni came into its own. Whenever a new tribe was encountered by the expedition, Lewis and Clark staged a grand entrance calculated to impress (or intimidate) the natives. Such pomp and ceremony, they believed, would dissuade potentially hostile actions by the Native Americans while they tried to understand who or what they were confronting. Lewis and Clark did their utmost to impress the tribesmen. The explorers donned their most colorful military uniforms—frock coats, sparkling swords, formal headgear, polished muskets and bayonets—and with flags flying and fifes whistling, they marched boldly into each meeting. The explorers greeted the assembled tribesmen with formal gravity and then proceeded to hand out gifts such as bolts of colored cloth, beads, and commemorative medallions.

At some point in the proceedings, Lewis would confidently display his Girandoni and demonstrate its remarkable power. In his journal, Private Joseph Whitehouse described one such event on August 30, 1803, at a Yankton Sioux village located along the Calumet Bluffs of the Missouri River: "Captain Lewis took his Air Gun and shot her off, and by the Interpreter, told them that there was medicine in her, and that she could do very great execution," wrote Whitehouse. "They all stood amazed at this curiosity; Captain Lewis discharged was done the Air Gun several times, and the Indians ran hastily to see the holes that the Balls had made which was discharged from it. At finding the Balls had entered the Tree, they shouted a loud at the sight and the Execution that suprizd [sic] them exceedingly."

Lewis would repeat this demonstration for every tribe encountered (there are no fewer than 39 separate entries in the expedition's journals mentioning the Girandoni), leaving all onlookers in doubt as to how many of these weapons the expedition carried. As much as the Indians coveted the guns and goods which the Corps of Discovery carried, none was bold enough to make an outright grab for the goods. If each of the explorers had a Girandoni, with the capability of firing two dozen shots in seconds with deadly accuracy, any hostile acts could be handled easily by the small band. The leadership of the various tribes encountered must have reasoned that any possible gain was not worth the risk of losing scores of warriors.



The Girandoni was known in Austria as a windbusche, or “wind rifle.” © National Firearms Museum

At village after village, the small band of 38 explorers was allowed to pass safely without a single casualty through some of the most hostile and warlike peoples on earth. This is not to say that the Girandoni guaranteed an effortless expedition. There were some close calls for the explorers where fast talking and bravado likely saved their scalps, and at least one warrior was killed in a confrontation over guns, but the enterprising foray into the wilderness succeeded beyond the wildest dreams of trip sponsor President Thomas Jefferson.

With the expedition over, the Corps of Discovery returned tired and ragged but exuberant about having accomplished their mission with only a single fatality, Sergeant Charles Floyd, who apparently died of acute appendicitis and was buried near the site of present day Sioux City, Iowa. After the finish of the expedition, the Girandoni air rifle disappeared into the mists of history—that is, until recently.

## **Discovering and Duplicating the Girandoni Used During the Lewis and Clark Expedition**

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Enter Dr. Robert Beeman, a distinguished university professor, first chairman of San Francisco State University’s Department of Marine Biology and former fellow of the National Science Foundation at Stanford. As a youngster, Beeman had received a Daisy BB gun as a gift, and the weapon stirred a lifelong passion for air rifles. In time, Beeman’s name would become synonymous with air rifles after his boyhood interest led him to found the world-famous Beeman Precision Airgun company. In addition to designing and promoting air rifles, Beeman began collecting every sort of unusual and historical air rifle he could find during travels taking him to various arms factories, museums and private collections around the world. One such acquisition was a Girandoni air rifle in remarkably good repair.

In 2004, Beeman was contacted by master gunsmith Ernie Cowan, who wanted to duplicate the Girandoni weapon in his collection (Beeman’s was the sole representation of the weapon in North America). Beeman agreed. Cowan and his collaborator, Rick Keller, in carefully disassembling the weapon, made an electrifying discovery. In their careful dissection of the Girandoni, Cowan and Keller found evidence of repairs made to the piece that noted gun historian Mike Carrick confirmed as corresponding precisely to entries in the journals of the Lewis and Clark expedition recounting such repairs. Perhaps the most

significant repair they discovered was a replaced mainspring. Lewis noted exactly such a repair in his June 10, 1805, journal entry: “[Expedition gunsmith John] Shields removed the main Spring of my air gun.” The repair was made with a farrier’s file ordinarily used to trim horses’ hooves. Other repairs included a new forward pin lug, middle thimble, and scarf joint in the rifle’s forearm, which replaced European walnut with good American walnut.

To his surprise and gratification, Beeman found himself the proud owner of the famous Lewis and Clark Girandoni. Beeman concedes that the Girandoni has a very peculiar and significant place in American history, but adds scrupulously: “We must avoid the very misleading thought that the Girandoni opened or won the West. Rather it was the key to Lewis and Clark returning alive and promoting the West.”

Beeman’s Girandoni has been extensively studied and field tested repeatedly to ascertain its capabilities. Without a doubt it is a stunning instrument. To spare the original repeated wear-and-tear, four exact copies of the weapon have been produced by Cowan and Keller. Recognizing its historical significance, Beeman donated the original weapon to the permanent collection of the U.S. Army War College in Carlisle, Pennsylvania. It is now on loan to and on special display at the Pentagon. Despite great scientific and technical advances in weaponry, few single weapons can rival the Girandoni for the peaceful promotion of American interests. That lack of violence, in itself, makes the Girandoni of the Lewis and Clark expedition a truly singular western weapon indeed.

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# EXHIBIT 27

*Weapons*  
OF THE  
*Lewis & Clark Expedition*

BY JIM GARRY



THE ARTHUR H. CLARK COMPANY

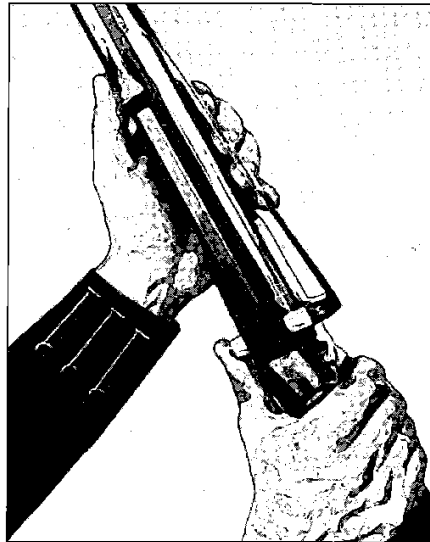
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100 WEAPONS OF THE LEWIS AND CLARK EXPEDITION



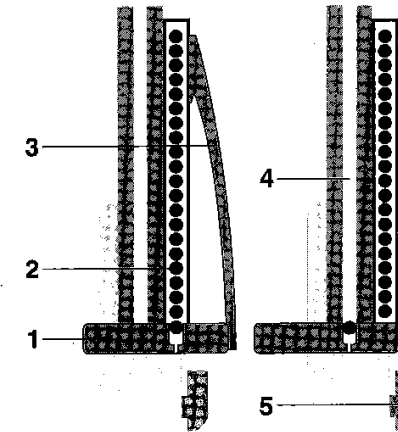
**LOADING THE GIRANDONI AIR RIFLE**  
This shows a soldier loading the rifle by pushing the breech block to the right with his thumb. This must be done while holding the rifle vertically, as the balls feed down the magazine by gravity. *Courtesy Michael F. Carrick.*

in front of the hammer, is a tube about a foot long and about a half inch in diameter, capable of holding about twenty rifle balls. The front of the tube is gated, and a leaf spring, attached just behind the gate, runs slightly more than the length of the tube along its right side. There is a sliding breech block that sticks out on both sides of the weapon. The right side of the block closes the back of the tube magazine, its right edge in contact with the magazine's leaf spring. The left side projects from the weapon roughly an inch and a half to two inches.

When the rifleman pushes that block to the right, it moves against the spring and places a funnel-shaped hole in the block over the end of the magazine. The hole is large enough in the front for a ball to enter and too small in the back for the ball to fall through—but large enough for air to pass. By holding the rifle muzzle up the shooter allows gravity to drop a ball into the breechblock's hole. When the block is then released from the

AIR RIFLE 101

**SCHEMATIC OF THE GIRANDONI AIR RIFLE**  
(1) breech block; (2) magazine (filled with balls); (3) leaf spring; (4) barrel; (5) hammer. By pushing the breech block to the right while holding the rifle in a barrel-up position, the leaf spring is displaced to the right and a ball falls into the breechblock. Releasing the block, the leaf spring pushes the block back, positioning the ball in line with the barrel and the air cylinder to the rear. *Courtesy Michael F. Carrick.*



left, the leaf spring forces the block back to the left and the hole containing the ball is moved back in line with the rifle barrel. The shooter then cocks the hammer and air is released from the reservoir into a chamber between the stock and the breech block until the pressure in the two chambers is equalized. Then the reservoir valve closes. (The failure of this valve from something as insignificant as a bit of dirt could easily explain the problem of the weapon when Lewis was demonstrating it to Thomas Rodney.) Pulling the trigger then opens the valve at the front of the forward air chamber, and the air pressure sends the ball down the barrel at a speed of several hundred feet per second.

Lewis's first journal entry does state that he had purchased the air gun, but neither that or any evidence has surfaced to explain exactly where or when he acquired it. There is no other good evidence for Girandoni-style air rifles having made it to the United States by the beginning of the nineteenth century. Since so many different manufacturers in so many different countries were producing the weapons, it is easy to imagine them being

# EXHIBIT 28

## The Founders were well aware of continuing advances in arms technology

 [reason.com/volokh/2023/05/26/the-founders-were-well-aware-of-continuing-advances-in-arms-technology](https://reason.com/volokh/2023/05/26/the-founders-were-well-aware-of-continuing-advances-in-arms-technology)



During the 19th century, firearms improved more than in any other century. As of 1800, most firearms were single-shot muzzleloading blackpowder flintlocks. By end of the century, semiautomatic pistols using detachable magazines with modern gunpowder and metallic cartridges were available. Would the Founders be surprised by the improvements in ability to exercise Second Amendment rights? Perhaps not, given the tremendous advances in firearms that had taken place before 1791. And certainly not, given that James Madison, author of the Second Amendment, initiated a federal government industrial with the specific aim of vastly improving the quality and quantity of firearms manufacture.

Part I of this post briefly describes Some of the firearms advances before 1791. Part II describes the federal industrial policy for advancing firearms technology.

This post is based on my article *The History of Bans on Types of Arms Before 1900*. It is forthcoming in Notre Dame's *Journal of Legislation*, vol. 50, no. 2, in 2024. The Post also draws on chapter 23 of my coauthored textbook *Firearms Law and the Second Amendment: Regulations, Rights, and Policy* (Aspen Pub., 3d ed. 2022).

## **I. Firearms improvements before 1791**

While the Founders could not foresee all the specific advances that would take place in the nineteenth century, the Founders were well aware that firearms were getting better and better.

Tremendous improvements in firearms had always been part of the American experience. The first European settlers in America had mainly owned matchlocks. When the trigger is pressed, a smoldering hemp cord is lowered to the firing pan; the powder in the pan then ignites the main gunpowder charge in the barrel.

The first firearm more reliable than the matchlock was the wheel lock, invented by Leonardo da Vinci. In a wheel lock, the powder in the firing pan is ignited when a serrated wheel strikes a piece of iron pyrite. The wheel lock was the first firearm that could be kept loaded and ready for use in a sudden emergency. Although matchlock pistols had existed, the wheel lock made pistols far more practical and common. Paul Lockhart, *Firepower: How Weapons Shaped Warfare* 80 (2021).

The wheel lock was the "preferred firearm for cavalry" in the sixteenth and seventeenth centuries. *Id.* The proliferation of wheel locks in Europe in the sixteenth century coincided with the homicide rate falling by half. See Carlisle E. Moody, *Firearms and the Decline of Violence in Europe: 1200-2010*, 9 Rev. Eur. Stud. 53 (2017)

However, wheel locks cost about four times as much as matchlock. Moreover, their moving parts were far more complicated than the matchlocks'. Under conditions of hard use in North America, wheel locks were too delicate and too difficult to repair. The path of technological advancement often involves expensive inventions eventually leading to products that are affordable to average consumers and are even better than the original invention. That has been the story of firearms in America.

### **Flintlocks quintuple the rate of fire**

The gun that was even better than the wheel lock, but simpler and less expensive, was the flintlock. The earliest versions of flintlocks had appeared in the mid-sixteenth century. But not until the end of the seventeenth century did most European armies replace their matchlocks with flintlocks. Americans, individually, made the transition much sooner. Lockhart at 106.

Indian warfare in the thick woods of the Atlantic seaboard was based on ambush, quick raids, and fast individual decision-making in combat—the opposite of the more orderly battles and sieges of European warfare. In America, the flintlock became a necessity.

Unlike matchlocks, flintlocks can be kept always ready. Because blackpowder is hygroscopic, and could be ruined by much water, it was common to store a firearm on the mantel above the fireplace. Another advantage, which mattered greatly in America but was mostly

irrelevant for European warfare, is that a flintlock, unlike a matchlock, has s no smoldering hemp cord to give away the location of the user. Flintlocks are more reliable than matchlocks—all the more so in adverse weather, although still far from impervious to rain and moisture. Significantly, Flintlocks are much simpler and faster to reload than matchlocks. See, e.g., W.W. Greener, *The Gun and Its Development* 66-67 (9th ed. 1910); Charles C. Carlton, *This Seat of Mars: War and the British Isles 1585-1746*, at 171-73 (2011).

Initially, the flintlock could not shoot further or more accurately than a matchlock. Lockhart at 105. But it could shoot much more rapidly. A matchlock takes more than a minute to reload once. *Id.* at 107. In experienced hands, a flintlock could be fired and reloaded five times in a minute, although under the stress of combat, three times a minute was a more typical rate. *Id.* at 107-08. Compared to a matchlock, a flintlock was more likely to ignite the gunpowder charge instantaneously, rather than with a delay of some seconds. *Id.* at 104. "The flintlock gave infantry the ability to generate an overwhelmingly higher level of firepower." *Id.* at 107.

The Theoretical Lethality Index (TLI) is a measure of a weapon's effectiveness in military combat. The TLI of a seventeenth century musket is 19 and the TLI of an eighteenth century flintlock is 43. Trevor Dupuy, *The Evolution of Weapons and Warfare* 92 (1984). So the transition of firearm type in the American colonies more than doubled the TLI. There is no reason to believe that the American Founders were ignorant of how much better their own firearms were compared to those of the early colonists.

### **Joseph Belton's 16-shot model**

In 1777 in Philadelphia, inventor Joseph Belton demonstrated a firearm that could fire 16 shots all at once. The committee watching the demonstration included General Horatio Gates, General Benedict Arnold, and scientist David Rittenhouse. They wrote to the Continental Congress and urged the adoption of Belton guns for the Continental Army. Congress voted to order a hundred—while requesting that they be produced as 8-shot models, since gunpowder was scarce. However, the deal fell through because Congress could not afford the high price that Belton demanded. Repeating arms were expensive, because their small internal components require especially complex and precise fitting.

Hence, the Founders who served in the Second Continental Congress were well aware that a 16-shot gun had been produced, and was possible to produce in quantity, for a high price. Delegates to the 1777 Continental Congress included future Supreme Court Chief Justice Samuel Chase, John Adams, Samuel Adams, Francis Dana, Elbridge Gerry, John Hancock, the two Charles Carrolls from Maryland, John Witherspoon (President of Princeton, the great American college for free thought), Benjamin Harrison (father and grandfather of two Presidents), Francis Lightfoot Lee, and Richard Henry Lee .

### **The Girardoni rifle**



Likewise, the 22-shot Girardoni rifle famously carried by the Lewis & Clark expedition starting in 1803 was no secret, as it had been invented in 1779. It was used by the Austrian army as a sniper rifle. Powered by compressed air, its bullet his as hard as the modern Colt .45ACP cartridge. John Paul Jarvis, *The Girandoni Air Rifle: Deadly Under Pressure*, Guns.com, Mar. 15, 2011.

The Girardoni had a 21 or 22 round caliber tubular magazine, and could be quickly reloaded with 20 more rounds, using speedloading tubes that came with the gun. After about 40 shots, the air reservoir could be exhausted, and would need to be pumped up again.

### **Repeaters in ordinary commerce**

As of 1785, South Carolina gunsmith James Ransier of Charleston, South Carolina, was advertising four-shot repeaters for sale. *Columbian Herald* (Charleston), Oct. 26, 1785.

### **The American Rifle**

The founding generation was especially aware of one of the most common firearms of their time, the Pennsylvania-Kentucky rifle, which is also called "The American Rifle." The rifle was invented by German and Swiss gunsmith immigrants in the early eighteenth century. When they came to Pennsylvania for religious freedom, they were familiar with the heavy Jaeger rifles of Central Europe.

The American Rifle was created initially for the needs of frontiersmen who might spend months on a hunting expedition in the dense American woods. "What Americans demanded of their gunsmiths seemed impossible": a rifle that weighed ten pounds or less, for which a month of ammunition would weigh one to three pounds, "with proportionately small quantities of powder, be easy to load," and "with such velocity and flat trajectories that one fixed rear sight would serve as well at fifty yards as at three hundred, the necessary but slight difference in elevation being supplied by the user's experience." Robert Held, *The Age of Firearms: A Pictorial History* 142 (1956). "By about 1735 the impossible had taken shape" with the creation of the iconic American Rifle. *Id.*

As for the most common American firearm, the smoothbore (nonrifled) flintlock musket, there had also been great advances. To a casual observer, a basic flintlock musket of 1790 looks very similar to flintlock musket of 1690. However, improvements in small parts, some of them internal, had made the best flintlocks far superior to their ancestors. For example, thanks to English gunsmith Henry Nock's 1787 patented flintlock breech, "the gun shot so hard and so fast that the very possibility of such performance had hitherto not even been imaginable." *Id.* at 137.

The Founders were well aware that what had been impossible or unimaginable to one generation could become commonplace in the next. With the federal armories advanced research and development program that began in the Madison administration, the U.S.

government did its best to make the impossible possible.

## **II. James Madison and James Monroe, the founding fathers of modern firearms**

U.S. Representative James Madison is well-known as the author of the Second Amendment and the rest of the Bill of Rights. What is not well-known is how his presidency put the United States on the path to mass production of high-quality affordable firearms.

Because of weapons procurement problems during the War of 1812, President Madison's Secretary of War James Monroe, who would succeed Madison as President, proposed a program for advanced weapons research and production at the federal armories, which were located in Springfield, Massachusetts, and Harpers Ferry, Virginia. The Madison-Monroe program was to subsidize technological innovation. Ross Thomson, *Structures of Change in the Mechanical Age: Technological Innovation in the United States 1790-1865*, at 54-59 (2009). It was enthusiastically adopted with the support of both the major parties in Congress: the Madison-Monroe Democratic-Republicans, and the opposition Federalists. 8 Stat. 204 (1815); Johnson, Kopel, Mocsary, Wallace & Kilmer, *Firearms Law and the Second Amendment: Regulation, Rights, and Policy* 2209 (3d ed. 2022) (online chapter 23).

While serving as ambassador to France, Thomas Jefferson had observed the progress that the French were making in producing firearms with interchangeable parts. He enthusiastically recommended that the United States do the same. See Letter from Thomas Jefferson to John Jay (Secretary of Foreign Affairs under the Confederation government), Aug. 30, 1785, in 1 *Memoirs, Correspondence, and Private Papers, of Thomas Jefferson* 299 (Thomas Jefferson Randolph ed., 1829). In 1801, President Jefferson recounted his French observations to Virginia Governor James Monroe and expressed hope for Eli Whitney's plan for interchangeable gun parts. Letter from Thomas Jefferson to James Monroe, Nov. 14, 1801, in 35 *The Papers Of Thomas Jefferson* 662 (Barbara B. Oberg ed., 2008).

Under the bipartisan Madison-Monroe program, generous federal arms procurement contracts had long lead times and made much of the payment up-front, so that manufacturers could spend several years setting up and perfecting their factories. The program succeeded beyond expectations, and helped to create the American industrial revolution.

The initial objective was interchangeability, so that firearms parts damaged in combat could be replaced by functional spare parts. After that would come higher rates of factory production. And after that, it was hoped, production at lower cost than artisanal production. Achieving these objectives for the more intricate and closer-fitting parts of repeating firearms would be even more difficult.



To carry out the federal program, the inventors associated with the federal armories first had to invent machine tools. Consider for example, the wooden stock of a long gun. The back of the stock is held against the user's shoulder. The middle of the stock is where the action is attached. (The action is the part of the gun containing the moving parts that fire the ammunition; the Founding generation called it "the lock.") For many guns, the forward part of the stock would contain a groove to hold the barrel.

Making a stock requires many different cuts of wood, few of them straight. The artisanal gunmaker would cut with hand tools such as saws and chisels. Necessarily, one artisanal stock would not be precisely the same size as another.

To make stocks faster and more uniformly, Thomas Blanchard invented fourteen different machine tools. Each machine would be set up for one particular cut. As the stock was cut, it would be moved from machine to machine. By mounting the stock to the machine tools with jigs and fixtures, a manufacturer could ensure that each stock would be placed in precisely the same position in the machine as the previous stock. The mounting was in relation to a bearing — a particular place on the stock that was used as a reference point. To check that the various parts of the firearm, and the machine tools themselves, were consistent, many new gauges were invented. Felicia Johnson Deyrup, *Arms Makers of the Connecticut Valley: A Regional Study of the Economic Development of the Small Arms Industry, 1798-1870*, at 97-98 (1948); Thomson at 56–57.

What Blanchard did for stocks, John H. Hall, of the Harpers Ferry Armory, did for other firearms parts. Hall shipped some of his machine tools to Simeon North, in Connecticut. In 1834, Hall and North made interchangeable firearms. This was the first time that geographically separate factories had made interchangeable parts. *Id.* at 58; Merritt Roe Smith, *Harpers Ferry Armory and the New Technology: The Challenge of Change* 212 (1977).

Because Hall "established the efficacy" of machine tools, he "bolstered the confidence among arms makers that one day they would achieve in a larger, more efficient manner, what he had done on a limited scale. In this sense, Hall's work represented an important extension of the industrial revolution in America, a mechanical synthesis so different in degree as to constitute a difference in kind." *Id.* at 249.

The technological advances from the federal armories were widely shared among American manufacturers. The Springfield Armory built up a large network of cooperating private entrepreneurs and insisted that advances in manufacturing techniques be widely shared. By mid-century, what had begun as the mass production of firearms from interchangeable parts had become globally known as "the American system of manufacture"—a system that encompassed sewing machines, and, eventually typewriters, bicycles, and automobiles. See, e.g., David R. Meyer, *Networked Machinists: High-Technology Industries In Antebellum America* 81-84, 252-62, 279-80 (2006).

Springfield, in western Massachusetts on the Connecticut River, had been chosen for the federal armory in part because of its abundance of waterpower and for the nearby iron ore mines. Many private entrepreneurs, including Colt and Smith & Wesson, made the same choice. The Connecticut River Valley became known as the Gun Valley. It was the Silicon Valley of its times, the center of industrial revolution. *Id.* at 73–103, 229–80.

In short, the Founding generation was familiar with tremendous advances in firearms technology. In the American colonial experience, the rate of fire for an ordinary firearm had quintupled. As of 1791, repeating firearms capable of firing 16 or 22 shots had been demonstrated, but they were much too expensive for ordinary citizens. The Madison-Monroe administration's wise industrial policy, continued under future administrations, led the way towards the mass production of high quality firearms at low prices. No one in 1791 or 1815 could have foreseen all the firearms innovations in the 19th century. We do know that the American federal government did all it could to make those innovations possible.